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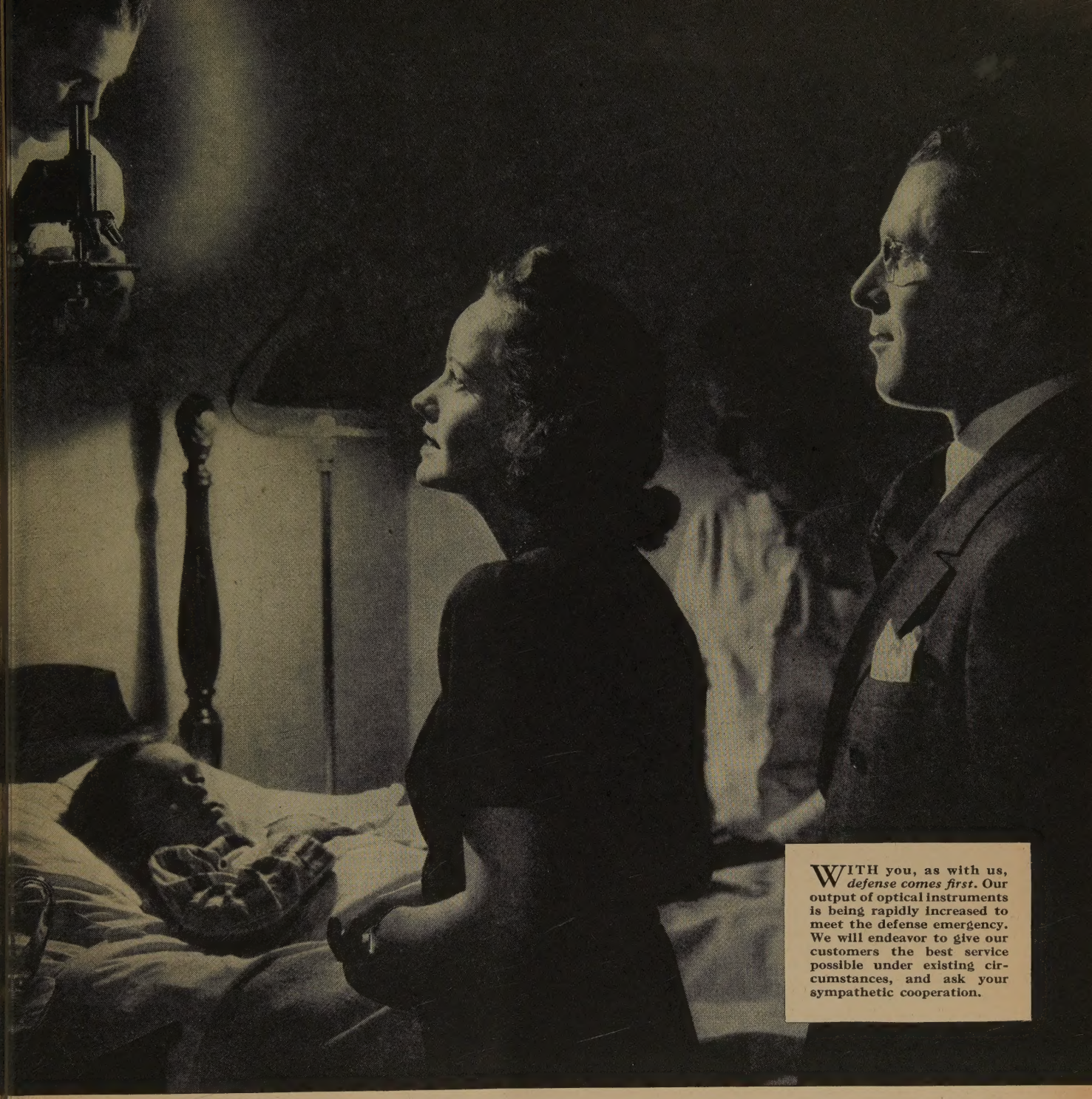

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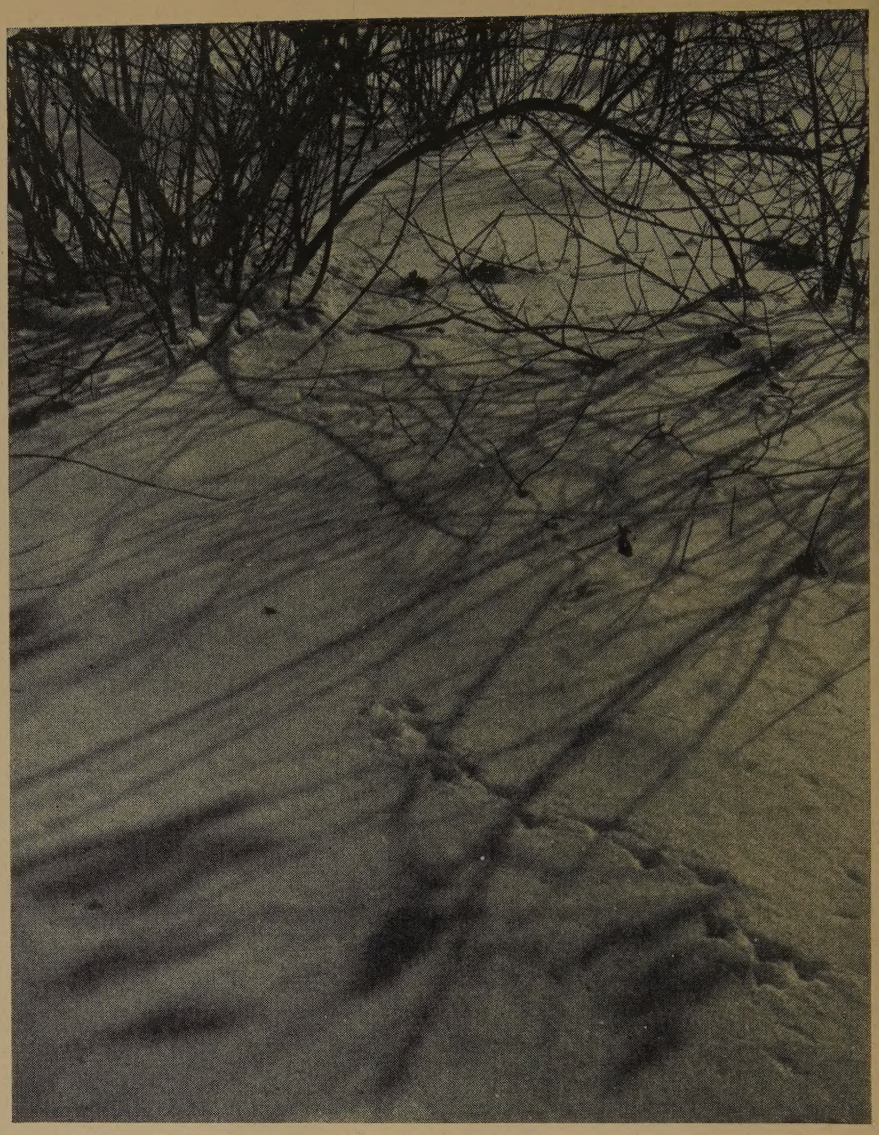
Camera Trails

BY NORRIS W. HARKNESS



RECORD IN THE SNOW. TAKEN WITH AN IKONTA B ON AGFA SUPERPAN AT 1/100 AT F/11

Snow Pictures

Whether it is falling or lying on the ground, snow is tops as picture material, and the Nature photographer who puts his camera away when cold weather first sets in is losing some of the year's best opportunities. The black and white of bare trees and bushes against the snow carpet is a natural black and white photographic subject, and it is, therefore, easier to see what the effect is going to be after the scene is on paper. Then, too, the contrast of the light, brilliant snow and the dark branches makes for dramatic pictures and simple compositions that are comparatively easy as photographic problems. So let us get the camera out from under the summer flannels and start shooting.

Snow pictures fall into several categories. There are the shots of trees or people leaning against the wind while the storm rages, and the quiet landscapes after it is over. There are the bright, sunny scenes, and the dull, flat ones that speak of cold, shut-in weather and old-time country winter. Then there are the little things like the snow-covered woodpile, the fresh-cut path to the barn, and the tracks of animals. It is these last that will challenge the Nature photographer, but all of them are worth his while.

To begin with storm pictures, falling snow always looks queer if any of the flakes are too near the camera. They are so big that they do not look right. And we see them moving, so too fast a shutter speed will "freeze" them too still and lose the feeling of motion. The best plan is to make the shot from the shelter of a deep doorway with the shutter set at not faster than 1/50 second and the diaphragm at whatever stop the light calls for for that speed. Often the diaphragm will have to be wide open to get sufficient exposure, but try to keep the opening as small as you can to get plenty of depth of field. If the snow picture is out of focus, it will not hold its full attractiveness.

The dull landscape under a cloudy sky is a flat subject that may be shot successfully with almost any reasonable exposure, but may need to be printed on rather contrasty paper. It is the one type of snow scene that is better with a fairly wide aperture and less depth of field, and the camera should usually be focused on a fairly short distance to make the distant part of the scene more soft in focus. That will make the distance seem covered with low-hanging clouds and add to the wintry effect. A filter will not help to bring out what clouds can be distinguished unless the sky that shows is blue and you will probably have to be content with a gray sky. Still, emptiness is the most frequent theme of such pictures, and human or animal "life" in the field of view will not help as much as in other, more lively shots.

The brilliant landscapes are the most exciting and their success depends primarily on the direction of the light. It should rarely be behind the camera and the more it approaches the against-the-light condition the more striking the picture becomes. At worst the light should come from one side to throw the tiny shadows beside each furrow in the flat snow and bring out its texture. A medium yellow filter with a factor of perhaps 1½ for Panchromatic film, and 2 or 2½ for Verichrome, will darken the sky enough to bring out the clouds and emphasize the shadows. Snow reflects the color of the sky strongly and the filter has nearly as much effect on the contrast of snow and shadow as it has on sky and clouds.

If there is little dark area in the picture, and the detail in the tree trunks does not matter in the effect you want, the exposure problem is simple. Something approximating half the exposure needed for that scene on a bright summer day will work well. But if you want to show the bark in the shadows as well as the snow texture, you will need to be more careful. A good plan, if you are using a meter, is to take a reading on the bright snow at your feet and another of only the light from the dark shadow and then set the camera half way between the extremes. Without one, try several different settings, the first time making notes of each one and then see which works best when the prints are made.

The woodpile and the path are lighting problems too. They need much the same treatment as the bright landscapes, and can usually be handled in the method outlined above. The against-the-light scheme is always good but you must be careful not to allow any light to shine into the lens either from the sun direct, or reflected from any object brighter than the subject. A deep hood over the lens is necessary for every picture you make and especially so for snow shots.

The most fascinating subjects, though, are bird and animal tracks. We have suggested them before, but they are so grand as subjects—both as single pictures and series shots to tell an adventure—that they cannot be recommended too often. Perhaps you will find a track that leads across the field and takes you to a sudden, wide, beaten area with a few feathers and possibly a blood stain. Maybe it is a rabbit track that ends where the hawk's wings have left their mark, or where fox tracks meet the one you are following. The whole story is there for you and your camera, and you will regret it if you let anything interfere with the immediate picturing of it. Use side lighting and make rather more shots than seem absolutely necessary. It is far easier to eliminate any unwanted print than to make another to fill a gap in the tale. Be sure to keep away from the tracks until you have them in the camera. The mixture of human tracks with those in the story will not add to its effectiveness. Make plenty of exposures and make each one as carefully as though the entire tale depended upon it alone. A tripod

and fairly long exposures with the diaphragm set at its smallest opening to get everything sharp will be most satisfying. But remember the side lighting. The depth of a track and the difference in level in the snow can only be shown by shadows, and they will show in the picture only if the light casts a shadow that can be seen by the lens.

So when snow begins to fall, remember that it is bringing you invaluable picture prospects and opportunities. Snow means pictures. Go get 'em!

The Problem Corner

P. W. N., Arvada, Colorado, asks: "What surface is good for a homemade screen for the projection of Kodachrome transparencies?"

ANS.—A heavy cloth stretched tight and then painted with several coats of flat white paint works well, but there is danger of its cracking if the screen is folded or bent too far. Oilcloth or glossy paints are too shiny and do not show the pictures satisfactorily. If the screen does not need to be too big, a permanent frame of wood covered with the painted cloth will last for years and may be repainted whenever it is necessary.

Mrs. T. E. C., Toledo, Oregon, asks about stereoscopic viewers and the enlargement of single frames from 16mm moving picture films.

ANS.—To my knowledge no one has brought out a stereo viewer for the small transparencies although undoubtedly one of the regular viewers could be adapted to those commercially available. However, there would be no stereo effect unless there was movement of the camera between the exposures. Two pictures from the same place will not show any more depth in a viewer than would two prints from the same negative. The stereo effect comes from two pictures that were made from positions separated at least the normal distance between the eyes. Each then shows a little more of its side of the object than does the other and your mind combines the two into a picture with natural depth.

The enlargement of 16mm frames is all right unless the print is to be big. The movie films are developed in contrasty solutions that yield grainy transparencies and the prints are rarely pleasant if more than four or five times as big as the original image. Since the movie film image is positive, a negative must be made from it and the print from that negative. Enlarging the 16mm film on commercial cut-film and then either enlarging the negative more or making contact prints from it is the best plan. Your dealer can supply the film and will make suggestions for its use with your equipment.

L. T., Detroit, Michigan, asks: "What camera size is best for making pictures of animals?"

ANS.—The question is less that of camera size than of the focal length of the lens. The longer the lens the larger the image of the animal on the film and the less the enlargement needed to make a salable picture from the negative. So for fast moving birds and animals a 35mm camera, like the Leica or the Contax, with a telephoto lens might be best, or you might prefer a Speed Graphic or a Graflex with a lens of longer than normal focal length. The Korelle as sold by Burke and James has reflex focusing and may be equipped with a long lens. They may be reached at 223 West Madison Street, Chicago. You might also ask them about trading in your old camera.

A. N. J., Gloucester, Massachusetts, says: "The corners of my 2¼ x 2¼ inch negatives are light and empty when I use a filter as though something were cutting off the light from them. How can a filter do that?"

ANS.—The filter is not the trouble except indirectly. You use a lenshood that sits on the lens barrel when no filter is used and on the filter when it is on the lens. The thickness of the filter mount makes the hood stick out too far and cut into the field of view. To check this, make an exposure with the filter and no hood and then a duplicate with the hood on the filter. The cure will be a hood that has a little wider angle to keep its front edge out of the field or bending its circular front more nearly to a square. If you try the bending plan, be sure the flattened edges are parallel to the edges of the negative area. It is a good thing to have a hood that so nearly fits the field, but it was designed to stay closer to the lens.

This and That

The first and most important thing, after hoping you had a flawless holiday season, is to remind you that now is the time for next year's Christmas card negative. If the wreaths are still on the door, or the tree is still standing in the parlor, get busy and make the kind of negative you hunted for a month or two ago and could not find. You will need it next November.

Eastman Kodak has brought out pocket folders for the Minicolor prints they make from your Kodachrome transparencies. They make a fine, safe way to carry around those special shots you want to show to everyone. Incidentally, there is no use sending in poor Kodachromes to Eastman in the hope that they will help it in making the Minicolor prints. The Minicolor will be a faithful reproduction of the transparency and no better than its original. Dark areas or transparencies that were underexposed do not "come out" as well as lighter ones.

Willoughby's, Inc., 110 West 32nd Street, New York City, have announced a line of gadget bags that list from $3, in duck, to $8.65, in cowhide. They have pockets for everything and will help to keep your tailor's bill down if you are the kind of photographer who stuffs all the gadgets into his pockets. Write for their catalog and do not forget to mention Camera Trails.

Bell and Howell, 1801 Larchmont Avenue, Chicago, Illinois, have introduced an inexpensive title service for slide exhibitors. The 2 x 2 inch slides called "Title-craft Slide-titles" are on 35mm film in cardboard mounts. The wording is your own and the title slides may be in several colors and combinations. Write to the above company for full details.

We have been using the Grover View Camera made by Burke and James of 223 West Madison Street, Chicago, Illinois. It is substantially made and has all the adjustments that are so helpful when you are trying to get maximum depth of field for nearby objects. Their catalog showing the Grover, their B & J Press Camera, and the Solar Enlargers will be sent you on request to them.

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This is a section of a typical page:

EUONYMUS 219 EUPATORIUM

EUON'YMUS (*EVONYMUS*) lw
EUONYMUS

There is controversy both as to the spelling of this name and its gender. Linnaeus published this as masculine and in the form Evonymus. The spelling Eu- and feminine gender better conform to classic usage. The spelling Euonymus is now generally accepted and agrees with customary pronunciation. As International Rules now stand, Euonymus seems to be masculine.

acu'tus . . . . . E. fortunei
ala'tus . . . . . WINGED E.
—aper'tus . . . . . BLACKSEED W.E.
—ap'terus
¢DWARF (*compactus*) HV. E. alatus
america'nus lw . . . . . BROOK E.
—angustifo'lius . NARROWLEAF B.E.
aquifo'lium . . . . . HOLLYLEAF E.
atropurpu'reus lw . . EASTERN WAHOO (*Eastern Burningbush*)

The name E. atropurpureus is sometimes misapplied to E. europaeus a.

bulga'ricus . . . . . BULGARIAN E.
bungea'nus . . . . WINTERBERRY E.
¢MIDWINTER (*semipersistens*) HV.
¢WEEPING (*pendulus*)
echina'tus
europae'us . . . . . EUROPEAN E.
¢ALDENHAMENSIS. HV.
¢BRILLIANT
¢CRIMSONFRUIT (*atroruber*)
¢DWARF (*nanus*)
¢INTERMEDIUS
¢PURPLELEAF
¢WHITEFR[illegible]
fimbria'[illegible]
fort[illegible]

EUONYMUS japonicus, continued
SILVER VARIEGATED (*argenteo-variegatus*)
YELLOWEYE (*medio-pictus*)
kiautscho'vicus (*patens*)
SPREADING EUONYMUS
lanceifo'lius . . . . . LANCELEAF E.
latifo'lius . . . . . BROADLEAF E.
maack'i . . . . . MAACK E.
—lanceola'ta
macrop'terus (*ussuriensis*)
nanoi'des . . . . . LOW E.
na'nus . . . . . DWARF E.
—turkestan'icus (*E. n. koopmanni*)
nikoen'sis . . . . . NIKKO E.
nippon'icus . . . . . NIPPON E.
obova'tus . . . . . RUNNING E.
occidenta'lis lw . . WESTERN WAHOO (*Western Burningbush*)
—par'ishi
ores'bius
oxyphyl'lus
pa'tens . . . . . E. [illegible]
pauciflo'rus
pen'dulus
phello'manus
pla'nipes
pyg'm[illegible]
ra[illegible]

EUONYMUS, continued
SARGENT E. . **Euonymus sargentianus**
SIEBOLD E. . . . . **E. sieboldianus**
SPINYLEAF E. . . . . **E. ilicifolius**
SPREADING E. . . . **E. kiautschovicus**
WARTYBARK E. . . . . **E. verrucosus**
WESTERN WAHOO . . . **E. occidentalis**
WILSON E. . . . . **E. wilsonii**
WINGED E. . . . . E.
WINTERBERRY E. . . . E
WINTERCREEPER E. .
YEDDO E. . . . .

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BELL TELEPHONE SYSTEM

Nature in Print

By HOWARD ZAHNISER

BOOKS about the sources of life have always seemed timely in January.* One person may take a cue from the calendar and annually attempt to begin life anew during this designated First Month. Another, preferring not to confuse recency and newness, may consider January as merely another arbitrary period of time. Yet few can escape a New Year's greeting, and nearly all must be in January more conscious of those constantly changing entities called Past, Present, and Future, and especially interested in those books that deal with the sources of things.

Such an interest is well served by George Gamow, a professor of theoretical physics at George Washington University, who has recently written a *Biography of the Earth*. From the astronomical event that Professor Gamow fashionably calls "blessed," on into the catastrophic future that he foresees from a prologue of two billion years, this biography like those of men attempts to create an understandable narrative out of the relatively few facts of life that authors have available for the understanding and interpretation of their subjects. The result is a book that is exciting in its chronicle of events and satisfying in its recreation of a character—in this case the Earth itself.

One is constantly impressed with the creative imaginations of the scientists who have been dealing with the history of the universe and especially with the origins and nature of life. The work of a skilled writer of worthwhile fiction seems a good comparison. Believing that uninterpreted facts do not faithfully represent truth, the fiction artist mixes his facts with the apprehendings that come from the creative imagination, and his readers know better the lives of his characters than they do those of men whose biographies are merely chronicled in obituaries. So, also, the theoretical physicist or biologist marshals the scanty facts that are known about the geological past, and the obscure evidences of that past that live on within us and our surroundings; interprets them with his understanding; and his readers have the vision of a definite creation.

Such a work is Professor Gamow's *Biography of the Earth*. In an evening the reader of this volume can sit in an arm chair, whirling through astronomical space and yet quietly turning a few pages, and see through his mind the Earth breaking away from the Sun, the Moon spinning away from the Earth, the rise of continents, and the beginnings and changes of that mystery called life.

James G. Needham, in a similarly provocative work called *About Ourselves,* suggests anew the creative genius of the biologists who can visualize a development through the ages of the multitude of organisms on the Earth and especially that marvellous creature called man. "The mere mechanical complexity of our thinking apparatus," says Dr. Needham in one connection, "is beyond the compass of our thought." Yet, using this incomprehensible thinking apparatus, our scientists, and we after them, can attempt a comprehension not only of our own origins but of those of the Earth itself. More important still, there comes an approach to an understanding of ourselves—including the recognition of the fact that we are incapable of comprehending our own apparatus for comprehension!

Such brilliance in the imaginations of scientists is, of course, possible only because of the brilliance in discovery. An excellent example of this latter brilliance is the work of Dr. George Crile, eminent surgeon, who set out to find out all that could be discovered about the energy-controlling organs of man and other animals. "The brain, the heart, the thyroid gland, and the adrenal-sympathetic system," he says, "adaptively control muscular action, glandular secretion, and emotional expression, thereby generating and controlling the intelligence, power, and personality of the animal." He studied and weighed these organs in more than 3700 animals, from elephant to mouse, a prodigious task accomplished in part on extensive exploratory expeditions. His report of his experiences and findings in *Intelligence, Power and Personality* includes many interesting incidents and is impressive throughout. This book might well be described as a treatise on how energy in animals is controlled, and when the all-important nature of energy, which comes ultimately from the sun, is realized, the significance of the various ways in which it is controlled becomes apparent.

Yet the control of energy would be of little significance if its supply were interrupted. Though energy comes from the sun, even as the Earth itself did, according to Professor Gamow's description, we animals are helplessly unable to take it directly from the sun. The plants on which we depend are themselves dependent on the soil, *The Soils That Support Us,* as Charles E. Kellogg says in the title of his excellent text book and general-reader's introduction to another of the great sciences.

"The soil," as Dr. Kellogg says, "is the meeting place of the living matter at the surface and of the mineral matter beneath the surface, and of the atmosphere above and the solid rock underneath. Essentially all living matter depends upon it, directly or indirectly, is in fact a part of those very processes that (Continued on page 50)

*Recently published books discussed in this article are:

Biography of the Earth: Its Past, Present, and Future. By George Gamow. New York: The Viking Press. 1941. 242 pp., with 37 photographs, 58 text figures, and index. $3.00.

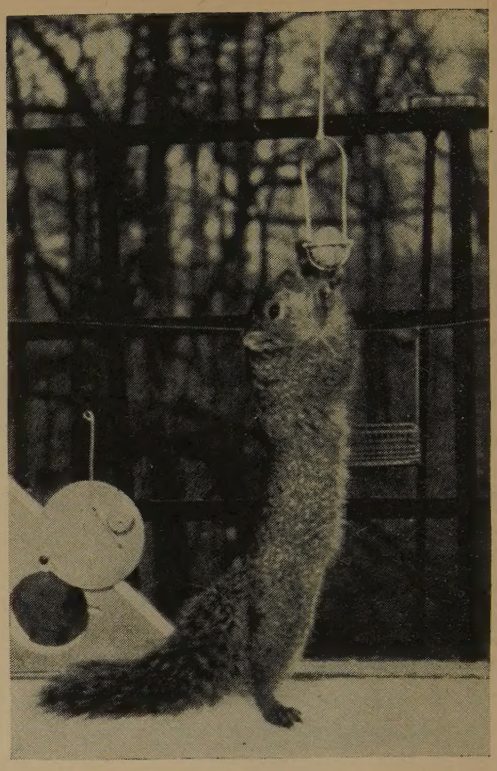
The Soils That Support Us: An Introduction to the Study of Soils and Their Use by Men. By Charles E. Kellogg. New York: The Macmillan Company. 1941. 370 pp., with index, glossary, bibliography, appendix on soil classification and soil maps, descriptive outline of the great soil groups, and 80 figures including numerous photographs, maps, and graphs. $3.50.

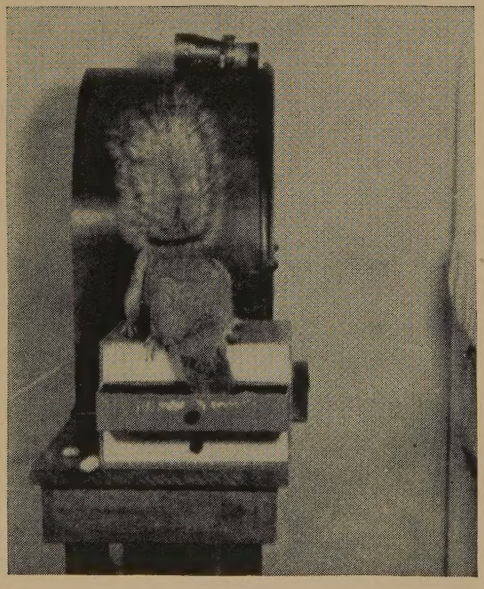
About Ourselves: A Survey of Human Nature from the Zoological Viewpoint. By James G. Needham. Lancaster, Pa.: The Jaques Cattell Press. 1941. 276 pp., with more than 44 line cuts by William D. Sargent, and index. $3.00.

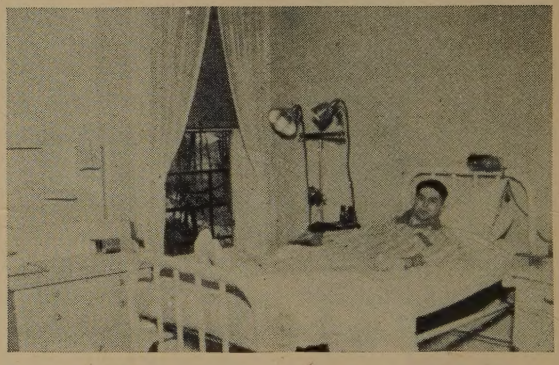
Intelligence, Power and Personality. By George Crile, edited by Grace Crile. New York and London: Whittlesey House, McGraw-Hill Book Company, Inc. 1941. 347 pp., with 41 photographs, 31 drawings, appendix by George Crile and Daniel P. Quiring listing the body weight and certain organ and gland weights of 3734 animals, and index. $3.00.

"Napoleon" had lost part of his tail in battle and seemed to have established his supremacy over other visitors. He inspects the Hawk-eye camera suspiciously.

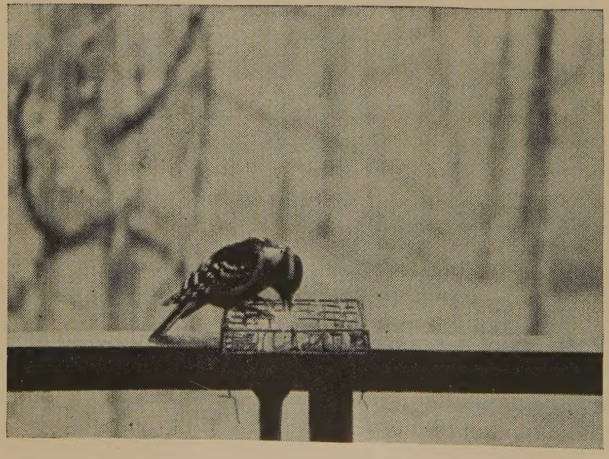
"Nicky" stretches to reach the nut in the basket attached to the window shade pull cord. Thus attached it can be adjusted to various heights. Also note the hole in the window through which the many visitors came and went.

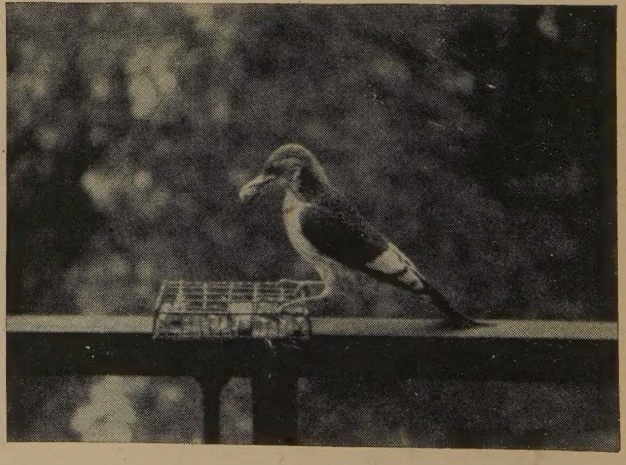






The author-photographer-host in his hospital bed, with his photoflood lights in position, and camera clamped to the light standard and focused on the chair by the window. At the left, "One Tuft" forages in the nut box at the side of the bed, having opened the drawer to see what was within. Below, two of the bird visitors, a male downy woodpecker and a young red-headed woodpecker, feast on the suet in the feeder attached to the fire-escape rail outside the bedroom window. The pictures were taken by the author from his bed within the room to which his many wild guests came.





NATURE MAGAZINE
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Patience, understanding and hospitality prove that it is possible to bring—

Nature—Two Flights Up

By CARROLL C. FOLTZ

IT WAS a thoroughly discouraged young man that was brought to Oak Ridge Sanatorium on May 9, 1938. A previous cure for pulmonary tuberculosis had broken down. My prospect was dark.

Shortly after my arrival a fox squirrel peeped in at me from the sill outside my window screen. Although never greatly interested in wild things, I suddenly had a goal. I wanted to feed one of those squirrels from my hand. To do so I would have to get much better, for even my movements in bed were then restricted to a minimum. Care, pleasant surroundings, and an improved mental attitude sped recovery, but it was the first of December before I had a chance to feed them. A few nuts laid outside on the window sill each morning would often disappear without my seeing what took them. So some small baskets of wire, each just large enough to hold a single walnut, were suspended about six inches above the window sill. The squirrels would jiggle these on the supporting wire and thus attract my attention.

Soon I learned that my visitors were extremely selfish; that the better fighters among them were able to keep the less aggressive from getting many nuts; that I was able to distinguish each individual by its appearance, and, later, by the distinct personality that each one possessed.

It was not long before one of the old males would come into the room and up to the bed to take a nut from my fingers. All the others were too shy even to venture to the inner edge of the window sill. With a common pin soldered to a length of wire, and a peanut impaled on this pin, I was able to offer provender to these, and slowly to lure them farther and farther into the room. A chair by the window made this less of an adventure to them. While getting up courage my fox squirrel guests would often do a nervous little dance, accompanying themselves by chattering their teeth. They keep both forepaws firmly planted, meanwhile raising first one hind quarter and then the other in a violent shaking of the hips—a sort of shimmy dance.

"NICKY" FEASTS ON CORN
An ear was stuck on a spike in a wooden block and attached to the fire-escape rail. Nicky was named for the nicks of battle scars

Another stratagem was a small wire basket fastened to the pull-cord of the window shade. When this was adjusted a foot or so above the sill, a squirrel would rear up on his hind legs and catch his claws in the basket. Its weight would pull the shade down and bring the nut within reach, but if the hold on the basket was released too suddenly, the shade and the basket would go up with a frightful clatter. At first this would cause hasty retreat, but soon the bolder ones would remain close by until I pulled the

"NICKY" EXPLORING FOR NUTS

He discovers them at the top of the Christmas stocking attached to the bedroom chair. Finding one balanced on the slightly-ajar bureau door, he learns that it can be had by pushing the door closed. He also learned to catch the nut as it fell. A bird visitor perches at the window hole gathering courage to enter

shade down and gave them another chance at the basket. Usually the shade was adjusted so that the bottom of the basket was from fourteen to sixteen inches above the sill. By experimenting I found that One Tuft, who has the longest body, could reach the basket at seventeen and one-half inches, but not at eighteen inches.

As the spring of 1939 approached, I was worried because window screens would prevent these daily visits. A friend came to my rescue by making a hole three and one-half inches in diameter in a triangular block of wood, with a plywood door that would swing down over this hole. This was set in the lower left-hand corner of one of the screens. A string was rigged so that, from my bed, I could open or close the small door. The squirrels were greatly puzzled by the window screens and the small doorway, but in a few days all got up courage enough to venture inside. In every case, once inside they would lose their nerve and make a dash for outside, bumping into the window screen. This unexpected barrier would throw them into a panic, which would gradually calm down and they would explore until they found the secret of the doorway. Once outside they seemed to think matters over for a few minutes, and, almost without exception, they would come back to take a nut from one of the small baskets. Within a couple of days all of them were able to locate the doorway without any trouble. Five of the squirrels learned to claw the door to one side and enter unbidden. Although the screen was removed during the winters of 1939 and 1940, those that had previous experience with it had no difficulty in entering or leaving, once the screen was replaced with the coming of spring.

From the first I fed each animal just a certain number of nuts each day. Once it had eaten its ration there were no more nuts forthcoming until the next day. Rough and Ready, so named because he was such a fighter, was never satisfied. He seemed to sense that if he could make me laugh, I would relent, so he was always doing clever little tricks to that end.

One of Rough and Ready's tricks was to perch on the radio beside my bed and look down into my eyes as if to say: "Won't you please give me one more nut? Can't you see I am starving?" It was such a pathetic look that he often broke me down. He would hunt a thrown nut until he found it, even in the wastebasket. Soon he learned that he could obtain a nut placed on top of a slightly-opened door of the washstand. He could not reach it from the floor, or by hanging down from the top. So he would stand on his hind legs, throw his forepaws against the door, forcing it shut and knocking the nut off. With practice he was able to catch the nut in his forepaws as it fell.

On the stand beside my bed, in addition to the radio, is the "nut box"—an old cardboard stationery box with three small drawers in it. One morning Rough and Ready was putting on his begging act. In the process he finally landed on top of the nut box, something he had done a few times before. When I proved stern and unyielding he leaned over the front of the nut box, opened the middle drawer with his teeth, grabbed a walnut and retreated in haste. He must have decided my chuckles at this audacity meant forgiveness because he came back and helped himself again. From then on he helped himself to his daily quota of walnuts from the drawer, but once he had taken his supply the box was moved to the top of the metal cabinet on the left side of my bed. He never offered to cross the bed in order to get at the box, possibly because

I always scolded him whenever he got on my bed, even though it was more or less by accident. I used to try to discourage him from helping himself from the drawer by reaching over and patting him on the head and back. He would tremble under my touch and did not appreciate the petting, but he would not let it interfere with the business of getting a nut. At times I would distract him enough so that he would open the top drawer by mistake. Then he would turn and look at me accusingly as if to say: "Now look what you made me do." There was a supply of peanuts in the top drawer, but Rough and Ready would eat them only if there were no walnuts available.

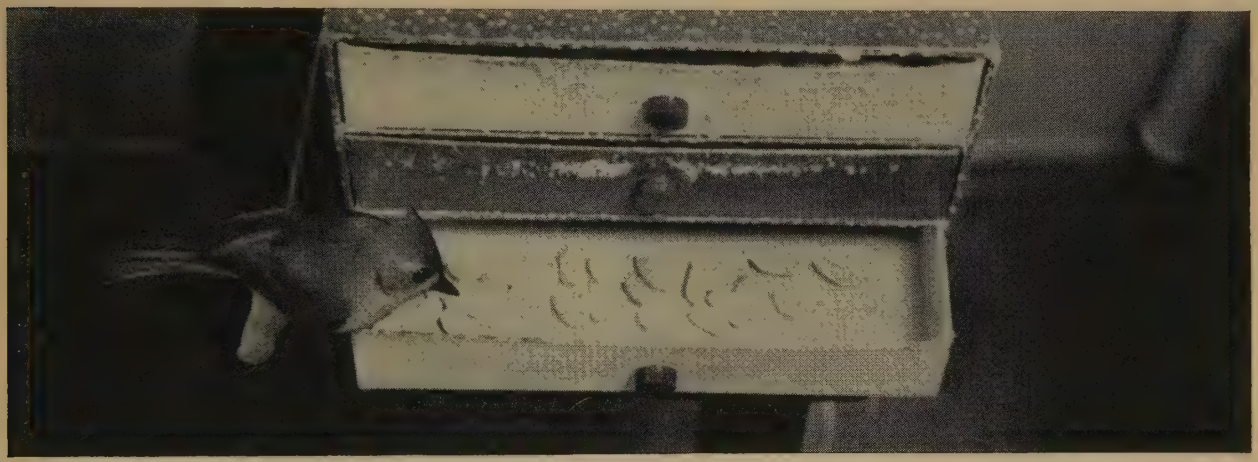
This individual was one of the fox squirrel patriarchs. The short hairs around his mouth were entirely white and the fur on his underbody a light gray. He was less active outside in the trees than the others. I have not seen him since May 20, 1940, and feel sure that he died of old age.

More than a score of different fox squirrels have come up the fire escape to visit me since I opened my nut cafeteria. Of that number there have been only two adult females. The females keep their fur better groomed than the males, and seem more intelligent in dealing with any given situation. Gladys came in January, 1939, and stopped coming a year later. Blogie started coming up in March of the same year and has been around ever since.

Gladys and Blogie both pulled fur for the nursery the last week in March, 1939, in anticipation of having babies. About the middle of May patients on the east side of the building reported Gladys carrying nuts from my supply to feed three young. The last week in May one of the babies followed Gladys up the fire escape. When she discovered it she slapped it across the face with a forepaw and sent it hurrying. Then, at intervals of a couple of days, the second and the third baby came tagging up. Each time Gladys would slap them and send them scurrying. This punishment did little good because they would come sneaking back up again when they thought she was not looking. She soon abandoned effort to keep them away.

During June, July and August of that year it was like attending a three-ring circus to watch the antics of Billy, Tilly and Lily—Gladys' three babies. For a week Billy was the only one bold enough to venture inside through the small doorway. Tilly was the next one to come in, and became the boldest of the trio. Lily was more demure and the last to enter. She was always shy and would yield the right of way to Billy or Tilly when the traffic at the door was heavy. I have seen Tilly sit calmly on the floor of my room and utter her high-pitched threats at such fighters as One Tuft or Rough and Ready when they happened in while she was inside. Any other squirrel, male or female, would have dashed frantically around my room in an effort to flee the impending wrath of these fighters. Strangely enough these two always took Tilly's threats at face value and never chased her as long as she was inside, although they would chase her if they caught her outside on the fire escape.

Tilly became so bossy that around the first of August Billy gave up coming up and trying to get inside past her. But I felt a real loss when, for some reason, Tilly and Lily stopped coming up around the first of September. Billy started coming back again in December of that year and has been around ever since. However, I have never seen Tilly, the Amazon, or Lily, since.



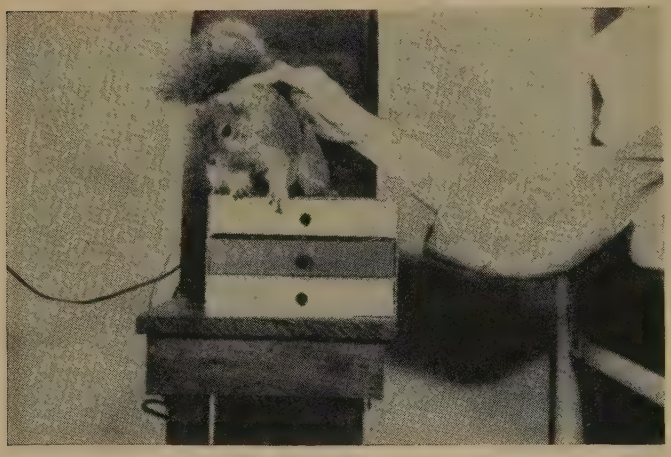
"MICKEY", THE TUFTED TITMOUSE, PATRONIZES THE NUT BOX

This visitor and some of his fellows proved to be the most venturesome among the birds, although it took patience to give them the confidence to enter the room and partake of the offered peanuts

On Memorial Day, 1939, one of my visitors brought me a sack of unroasted peanuts. Most of the squirrels turned up their noses at them. To get rid of them I would put a row on the sill just inside the window screen, so that the few individuals that would eat them could have as many as they wanted. Soon I began to notice some small gray birds, with tufts on their heads, come and pick at the window screen. From my bird books I learned that they were tufted titmice and that they would eat nuts. I tried laying a few of the unroasted nuts close by the small doorway, opening the door whenever I saw one of the birds around. They soon learned to come in but if they came too far they were apt to miss the doorway and fly against the screens and dresser mirror. In time, however, they grew as able as the squirrels in finding the doorway.

Mickey and Minnie—the titmice—learned to come inside for nuts from the stand, and Mickey finally learned to take nuts directly from the bottom drawer of the nut box. However, he stopped doing it when the screens were put back in the windows. Last winter the screens were removed from the windows on a Friday afternoon. When the windows were opened for rest hours the next morning I opened the nut-filled lower drawer. About an hour later Mickey came in and took a nut. The following day Minnie was also helping herself from the drawer.

At the time Billy, Tilly and Lily were coming up here I decided that I would like to take some pictures of my friends. To get the squirrels accustomed to the camera, I set it down where they could see it as they came inside. Each day I would move it a little nearer the small doorway. Then a peanut was fastened to the front of the camera by a rubber band in such a manner that a squirrel could easily remove it. I next taught my visitors to come in on the chair and take a nut from the front of the camera as I held it in my hand. Following that, I would snap the camera shutter each time a squirrel came after the nut. In slightly more than two weeks I had all my fox squirrels so that they no longer had any fear of the camera or the noise its shutter made.



My first efforts at picture taking were very poor, due to varying light, inexperience, and inadequate equipment. The Eastman Kodak Company advised me that I needed a camera with a f.4.5 lens, or faster, to get good pictures with my adverse lighting conditions. A cousin came to my rescue and I set about to accustom the squirrels to a new camera.

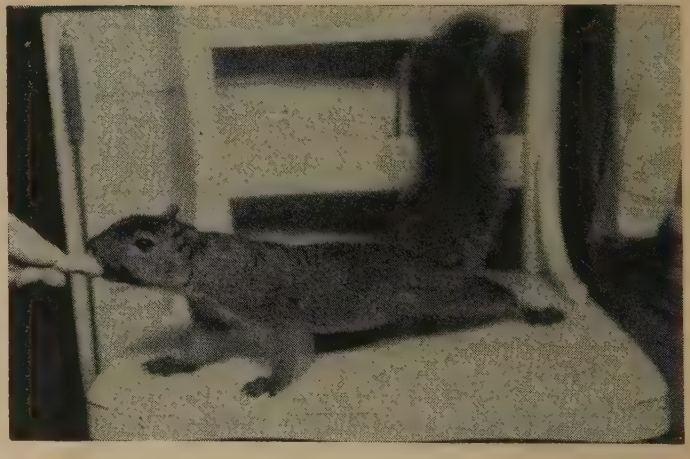
For a while I had felt that Rough and Ready was the best fighter. Then a younger male showed up that made him run. I named this new boss One Tuft, as he had a tuft of hair missing from the left side of his tail. His ears were unmarked by battle scars, and he had a long, thin, weasel-like body. It took just three days for One Tuft to learn to push the washstand door for a nut. However, it took a long time for him to decide to jump to the nut box and to learn to open the drawer with his teeth. One Tuft was always quite cooperative, however, whenever I wanted to get some pictures of his goings and comings.

Nicky received his name because of the prominent battle scars on both ears. He is the only one of the fox squirrels that recognizes its name when called. He is a coward and several times when one of the other animals have started chasing him inside my room, Nicky has jumped on the bed with me so that I could protect him. He learned the washstand door trick in one day, and the secret of the nut box in two weeks.

Baldy was quite bald from the head down beyond his shoulders when I first saw him. He has had a good coat of fur ever since, even though he usually has all the fur scratched off around his ears with the approach of spring each year. Baldy must have ill-fitting false teeth, since it takes him three times as long to eat a peanut as any of the other squirrels. Up until last winter he would refuse to tackle hickory nuts or black walnuts.

Napoleon, who I saw for the first time in January, 1940, has a short body and tail, evidently having lost half his tail in a battle. Neither One Tuft nor Rough and Ready ever challenged Napoleon, the question of his supremacy evidently having been decided at some previous time out in the woods.

Another unusual personality is Beau Brummel,



"ROUGH AND READY" ALLOWS HIS HOST TO GIVE HIM A STROKING

This was only achieved, however, after a long period, and the pat was accepted with reservations. Below, "Beau Brummel", a handsome fellow, as his name implies and the picture shows, accepts a peanut from the hand of the author. He is, however, ready to make a quick departure if he thinks it advisable or suspects greater familiarity

with his luxuriant coat of dark fur and unusually bushy tail. He is a ladies' man, being the only adult male that I ever saw the females follow around—at a respectful distance, of course. He has been my most consistent visitor since January, 1939.

The squirrels usually stop each morning in one of the trees directly across the driveway to clean up. They thoroughly wash their forepaws, face and ears, and comb out their tails by running them through between their forepaws and gnawing teeth. Then they do some vigorous stretching. If the coast is then clear they make a dash down across the driveway and up the fire escape for their breakfast. They always can be (Continued on page 52)

Tree immigrants prosper in a Florida meadow that is the—

Fairchild Tropical Garden

By RUTH KEDZIE WOOD

LIBRARY AND PALM PRODUCTS MUSEUM

This is a general view of the building in the Fairchild Garden as seen from the Bay side. A Cocos *plumosa* shades the roof from sub-tropical sun

It was in an obscure corner of southern Spain, where life still retains a Moorish accent, that I had my first real encounter with palms. In the calm of the patriarchal planting of an old date grove I learned the lore and the bounty of these trees. Then, in south Florida, I met other palms that soared and bore coconuts, and went in search of one to grace my yard. None of the easily available ones attracted me. Instead, I felt that I must have the one that grew in the domestic jungle behind a Colored Town shack.

It was the wrong time of year to disturb the tree. A flowering bush, a piece of fence, a hen house with hens, and a kettle full of clothes simmering over a charcoal fire had to be moved to let the truck in and get the palm out. With the aid of the Bahama Negro, who had raised it from a sprout and who directed the transplanting, the transition was made. During the winter the former owner came to visit the tree, exhorting it fervently, "Palm, you goin' grow; you goin' be all right." And grow it did.

With a palm of my own to tend and study, I became a palm enthusiast, seeking out relatives of my own tree. I became acquainted with many sabal palmettos; with delicate *Phoenix roebelenii;* with royal palms that grow wild in the Everglades; with the trim fish-tail; and the tall, fan-leaved *Washingtonia.* In dooryard and park the loveliest of all, to me, was *Cocos plumosa,* dripping fronds like green ostrich feathers.

In the process of my palm quest I learned that there are some two thousand species widely distributed over the face of the earth. The majority have plume-like fronds; a smaller number have leaves that are fan-like and stiff, resembling the open palm of the hand. Students of ancient palm history believe that this explains the name. I discovered that palms are mainstays in the lives of millions of people,

IN THE CYCAD QUARTER OF THE TROPICAL GARDEN

This general view shows the atmosphere of the garden, with various palms. At the left is *Nolina,* of the lily family, a genus mainly represented in Mexico and Central America, and barely reaching our southern border. It is a striking plant

DR. DAVID G. FAIRCHILD
INSPECTS A FAVORITE

The noted plant explorer and botanist has a particularly warm spot in his heart for this dwarf golden coconut palm that comes from Malaya. His palm of palms, however, is a giant called *Pigafetta elata* from an island in the Netherlands Indies

yielding oils, fibres, woods, saps, waxes, edible fruits and other products. Their place in human economy is tremendously important.

This importance of the palm gives special point to a project that has taken shape within the tawny fieldstone walls of the Fairchild Tropical Garden, with its associate collection, the Montgomery Palmetum. On eighty acres bordering the main highway three miles below the Miami suburb of Coconut Grove, assorted palms, fruit and flowering trees from torrid outlands grow for all to enjoy. Rare vines, planted by women members of the Garden Association, make a spectacular show on a rock and cypress pergola.

A low, inviting building of tropical-rural architecture contains the Brett botanical library —available to students—and a palm museum that has no counterpart. From its charmingly arranged displays the visitor gains a picture of the range of valuable materials produced by the palm for man's service.

Industry, vision, the boundless devotion of scientist and layman, have made possible this tropical park—plus, of course, growing conditions in south Florida. Few of the trees, vines and bushes seen here would survive anywhere in the United States except on this peninsula, which swings like a golden tassel deep into Caribbean waters. In this congenial climate immigrant trees and plants flourish as they would in the countries of their origin—sprouting, blossoming, fruiting, seeding under the open sky.

The undulant acres near the shore of Biscayne Bay have been so thoughtfully planted that the effect is that of a natural grove. Strolling beneath palm and bombax tree, the ylang-ylang and the mango, the visitor sees vistas of India, mid-Africa, Brazil, or the islands of the South Seas. This is an outdoors museum, embracing a hand-picked collection of specimens, both decorative and useful, gathered in the canyons and deserts, veldts and forests of far lands.

How all these plants from hot zones got together in a Florida meadow is a story bound up with the life accomplishments of a great exploring-naturalist, Dr. David G. Fairchild. Michigan-born, he is a leading specialist in the science of growing foreign plants. It has been a full-time profession with him since, half a century ago, he began working for the Government at Washington. In his early twenties he was assigned to a mission that, through his zeal for it, far outgrew its original intentions. It was his job to search out plants native to foreign soil that might be converted to the food, medicinal and industrial needs of the United States. He explored and investigated in all the continents

DR. FAIRCHILD'S GRAND-
DAUGHTER LOVES PALMS

Here Helene inspects the white, hairy coating on the leaves of this giant fern palm from the Island of Mauritius. It is known as *Latania loddigesii*. Now it is about eight feet tall but when it is mature it will tower to fifty feet and be an imposing tree

IN THE CYCAD "DEPARTMENT" OF THE GARDEN

Mrs. David Fairchild shows the curious leaves of these plants, which played such a part in prehistoric times, to her granddaughter, Helene Muller. This picture indicates the wide variety of tropical plants now growing in this enchanting museum

and in the South Seas. The results of his trips were passed on to American growers and manufacturers, through the Federal Office of Plant Introduction. Dr. Fairchild was still a young man when he organized the office of seed and plant introduction of the United States Department of Agriculture.

Read the two volumes he has written, *Exploring for Plants,* and *The World Was My Garden,* and you will know the lengths to which his ardor and genius have carried him, in years, in miles, and in achievement.

In 1898, it came south Florida's turn to be visited. Before the sandy little settlement on the Miami River had burst its chrysalis, or scarcely had begun to stir, he traveled down the scantily-populated coast, and began his first experiments in making fruits and vegetables grow that never grew in the United States before. In a latticed workshop, improved breeds of the mango, which the explorer introduced, were coddled to bloom. These now form a major regional crop. On his staff were plant propagators who adapted to American soil, and appetite, the pale green vegetable called chayote; also the flavorful West Indian yam.

Dr. Fairchild was instrumental in bringing from Central America novelties like the oily-fleshed avocado, a fruit so invigorating and sustaining that revolutionists in southern republics delay their fighting, it is said, until it hangs ripe and ready to eat on the trees. More than eighty varieties of papaya, or tree melon, were introduced into Florida and perfected and popularized under the stimulus of Dr. Fairchild's encouragement. The rich American tung oil industry, of enormous benefit to paint manufacturers, sprang from seeds imported from a part of China that formerly monopolized tung oil production. Experiments supervised by Dr. Fairchild are responsible for the great oil-producing groves of western Florida.

SUGAR PALM FROM THE EAST INDIES

It is known by the scientific name of *Arenga saccharifera.* At its heart are long cruel thorns that are discouraging to sap gatherers. A delicately-flavored sugar is the product of the sap of this palm that is becoming naturalized in Florida

Out of his doing and dreaming there was organized, in 1915, a unique propagating station that now covers some 160 acres to the south of Miami. From Chapman Field, Dr. Fairchild's staff has, in the past twenty-five years, distributed hundreds of thousands of cuttings, seeds and rooted plants for the profit and enjoyment of the people. Many exotic ornamentals raised at the United States Introduction Station now adorn the parks and highways of Florida.

It was in 1936 that he began to encourage the building of the show gardens now named for him. Through the generosity of a fellow

palm fancier, Colonel Robert H. Montgomery, ground on Old Cutler Road, in the Matheson Hammock area, was deeded to the Fairchild Tropical Garden. When planting was begun, Colonel Montgomery made another munificent gift of rare palms, raised on his nearby estate.

The home grounds of Dr. Fairchild and his wife, Marian Bell Fairchild, have yielded some notable trees started from seed gleaned on the other side of the globe, and reared to full stature in the Garden near Coconut Grove. It is expected that many young specimens will be added to the Garden collections as a result of a year's rambling tour of the Philippine Islands and the Malay Archipelago. This seed collecting tour was begun by Dr. and Mrs. Fairchild and an interested group of helpers in the summer of 1939. Already young and rare plants from these wanderings are growing in experimental plots. Precious seeds have been posted by airways to Coconut Grove —more than 250 shipments of them. They were gathered from magnificent aroids and pandans; from tropical novelties like palms with salmon-pink fruits; from swamp palms bearing blue fruits; from feather palms of volcanic mountain-sides; from palms with one-hundred-foot trunks rising from forests; from odd-tasting variants of the apple and persimmon; from vines of breath-taking fragrance and form. On arrival these were planted in the seed pans of the Fairchild Tropical Garden; many of them sprouted, and today an encouraging number have put out healthy shoots and make part of the glorious company in the eighty-acre meadow. Some day many of their offspring will be blooming familiarly in Florida dooryards, like many another plant given a start here by David Fairchild.

I asked the plant explorer to name for the readers of *Nature Magazine* the noblest palm he ever saw. At once he picked as the palm of palms one of the tallest kinds that grows, *Pigafetta elata.* A young scion of the species, in the Garden, is descended from a cloud-scratching giant that he saw when he visited an island of the Molucca group in the Netherlands Indies. A photograph of the mother tree hangs on the wall of the library.

Another supreme favorite of the explorer, as it must be of everyone that sees it, is the small Malay coconut, hung with fruits of gleaming gold color. Nothing more finished in the divine art of palm designing can be imagined. A group of the dwarf trees grows near some Mulgoba mangos.

A dedicatory label marks another tree that memorializes the African expeditions Dr. Fairchild made many years ago as guest of the late Allison V. Armour. The Boabab tree is frankly on the gaunt side, but it has legend and history to support it, and for age and girth it can scarcely be matched. When it gets to be really old—a couple of thousand years or so—the trunk hollows out and stores water, sometimes hundreds of gallons of it. Gawky and awkward as its branches are, lovely white flowers hang from them in the summer, each five inches in diameter.

Cousin to the Brazil nut, the cannon-ball tree, come flowering time, decorates the trunk and larger boughs with fleshy pink blossoms. Brown globular fruits develop, good for nothing, it seems, except for a deafening noise made when they fall to the ground. When these are ripe, the smashed jelly-like contents have an evil odor.

The bombax or silk-cotton tree, which grows in India and Ceylon—and now south Florida—is leafless in winter. But to make up for lack of foliage it produces splashing red flowers, good for seasoning curry powder. When the petals fall they spread a brilliant carpet under the branches.

A grove of trees of rare blooming habit is rising on a knoll. Before long it will be coloring the whole of the slope leading down to the site of the Garden's amphitheatre, to be built beside an artificial lake. An exotic orchard comprises groups of trees with enchanting names—mamey, sapodilla, loquat, *Monstera deliciosa,* papaya.

Cycads, whose story goes back to the Carboniferous Age, keep company with tufted pandans, and neighbor wild Florida palms with multiple trunks. A native cabbage palm with four stalks from but a single seed is on view; it was well started on its tree career before white men saw this part of the continent.

Everyone is interested in the traveller's tree, which stores a potable liquid at the base of its long leaf stalks, giving refreshment to thirsty wayfarers. The giant flowers it bears are fertilized by pollen carried on the breast feathers of visiting birds.

Two stalwarts of the species *Acrocomia totai* at the entrance gate are armed with spikes set round and round the columnar trunks. The why of these protective daggers is not known, Dr. Fairchild says, but they may have been a defensive measure against climbing marauders millions of years back. The warlike tree still carries its daggers.

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Fallacy

By ETTIE ROEMER HUNTER

I shall pretend until the end of me
That wind and water are aware and kind;
That something in still land and moving sea
Responds to my bewildered, seeking mind.
I shall keep always in my grown-up heart
The child I was, who dreamed this thing was so,
Assured each mood had friendly counterpart
In its companion hour of sun or snow.
She held hard rain was grief; high wind, a call;
Warm dusk was loneliness; a star, her friend.
She found her sorrow in a leaf's red fall,
Her joy in any April bough's bright bend.
It was not true, the old pathetic lie,
But she went comforted, and so shall I.

"IT IS THAT OLE DEBBIL POLLEN RIDING THE WIND AND REAPING A WHIRLWIND OF SNEEZES."

Famous pairs are Romeo and Juliet, ham and eggs, beans and brown bread, and—

Pollen and Hay Fever

Illustrated by Jex

By MARGATE KIENAST

YOUR ALLERGY is your personal hard luck. If you have one it is because you are abnormally sensitive to food, pollen, hair, or other substances that you inhale or eat. Whatever it may be that causes this kick-back is an allergen. Allergies are various, strange and surprising. Medically the field is broad, requiring volumes for complete discussion. However, the majority of people who are allergic are poisoned by a simple vegetable substance that to most is absolutely harmless. This is pollen. In the summer season hundreds of thousands of people in the United States are following a handkerchief around. They have hay fever. Ninety percent of our hay fever is caused by ragweed pollen.

Some of the measures you can take in your defense program against this nuisance are medical. If the problem were strictly a medical one, there would be no point in telling about it here. But hay fever is not caused by lack of mineral in the bones, by jumpy nerve endings in your nose, by cruising germs in your bloodstream—or by imagination. A useless weed, in full bloom, broadcasting a simple vegetable substance, is responsible for all this discomfort.

Ragweed is an unsightly, troublesome plant, good for just one thing—to make an outstanding contribution to the population's stuffy nose. In some eastern sections it is the giant ragweed that is the main offender; in other parts of the country it is the short ragweed.

Its generic name is *Ambrosia.* Linnaeus chose for it this label of the immortality-giving food of the Gods. John Burroughs regarded the high-sounding name in another light. He said: "It must be the food of the Gods, if anything, for as far as I have observed nothing terrestrial eats it—not even billy goats."

It is an easy jump from billy goats to the vacant lots and dumping places of our big cities. Right in these vacant lots, beside apartment houses, behind billboards, along railways, in factory districts, in detached residential developments, there are large areas of neglected weed-grown land. Dense growths of ragweed, sometimes ten feet high, are found along the banks of canals and rivers.

In a survey made in Chicago, there were pieces of empty

"CARDINAL CARAFFA IN THE 17TH CENTURY PLACED GUARDS AT HIS GATES TO UNBURDEN VISITORS OF ANY ROSES."

land adding up to 20 thousand acres, all supporting a luxuriant growth of ragweed. It was calculated by scientists, who set pollen catchers—plates covered with sticky substances—in outlying residential districts and on top of Chicago's tallest skyscraper, that hundreds of tons of ragweed pollen were liberated each year within the city limits. In mid-city you are as open to attack as if you had gone into the highways and hedges to look for it.

Allergists are a cautious lot. Some maintain that if a whole state were cleared of ragweed plants, not more than seventy-five percent of the atmospheric pollen would be reduced. Replacements would drift in on the wind from nearby states. But the most pessimistic analyst of the situation will admit that the sufferer is surely better off if the pollen-shedding weeds growing within a few hundred feet of his residence are eliminated.

Cutting down exposure is a gigantic task. It has, at times, claimed the attention of whole cities. Ordinances have been passed, and brigades of interested people have carried out intensive cutting and pulling campaigns. But cities and citizens alike usually have worked at it for a while—then rested on their implements and said "Well, what's the use—the stuff just keeps on coming back!"

Hay fever is new among *recognized* diseases, but we find mention of discomfort due to contact with plants in medical writing for the past 400 years. We cannot back up our suspicions as to the antiquity of hay fever with museum specimens gleaned from a buried city, an Indian mound or an Aztec temple. People do not die from eczema, hives or hay fever, even today. Hives leave no trace on a mummy. Asthma—the allergic kind—is closely related to hay fever, and Aretaeus, a Roman, first recognized asthma as a disease about A.D. 500.

Thomas Phaer, who died in 1560, wrote of "Nesying out of Measure." He said: "It is good to stoppe it, to avoyde a further inconvenience." He suggested that the victim should "emplayster the forhead and temples with mylke, oyle of roses, and vynegre a lytle."

Possibly the earliest reference to what we call hay fever was the description by Botallus of Batavia in 1586. He wrote of people in whom the smell of roses produced sneezing, headache, running at the nose and weeping. Cardinal Caraffa, in the 17th Century, placed guards at his gates to unburden visitors of any roses. Helmont, in 1607, described an asthmatic case in which symptoms occurred only in the summer time. This was the first reference to "seasonal occurrence". All these were just personal notes on the fact that odor of roses brought on odd attacks. There were never any suggestions on what to do about it.

In 1819, John Bostock, an English physician, placed hay fever in the list of clinical diseases by accurately describing his own case. Evidently the disease was quite well known in England by that time and was already popularly called "hay fever". The British developed their hay fever then, as now, from exposure to grasses. Ragweed is not native to England.

Then came Charles Blackley—also an English doctor. He was an honest observer, and, besides, he had hay fever. In 1859 Blackley collided with dried grass blossoms that one of his children had placed in a vase in the parlor. He got hay fever—and out of season, too.

Blackley thought: "In most diseases known to medicine something is out of kilter in the makeup of the patient when sickness strikes. Yes, and when it does, something comes in from outside and starts the actual trouble. Now what could there be about that grass that could make hay fever happen to me?" He went back to the dry grass bouquet and examined it. He had his clue. He got hay fever.

Here was a starting point—a scientific one, dooming Dr. Blackley to years of discomfort, for he doubled as his own guinea pig. He could not go about applying plant and

SAID BURROUGHS: "IT MUST BE THE FOOD OF THE GODS, IF ANYTHING, FOR AS FAR AS I HAVE OBSERVED NOTHING TERRESTRIAL EATS IT—NOT EVEN BILLY GOATS."

"AND WITH CLEARANCE OF THE LAND UP POPPED THE DEVIL—RAGWEED. IN A SHORT SEASON OR TWO SUSPICIOUS SNEEZES BEGAN TO VEX THE GUESTS. COMMERCE HAD AGAIN OVERSHOT THE MARK."

pollen mixtures to the eyes, nose and throat membranes of his patients. They came to be cured, not tormented. He had to use his own trigger-mechanism to test the pollens. He studied pollens of a hundred or more different plants and grasses. He learned what they did to him. Hay fever symptoms, if left to Nature and the patient, began when pollen of the grain started to increase in the air. They were at their worst when pollen concentration was at its height. He made of himself a human pollen meter. He had figured out a queer little process to test out pollens that were poison to him. He rubbed moistened pollen extract into himself to produce those welts that rose and itched and burned on his arms and legs. He knew which kinds made him "react", but he still needed to learn how many kinds of pollen caused hay fever. Then, too he wanted to know how much of it was floating around. He suspected that there was a whole world of plants busily at work pouring out pollen. Blackley did not want to know *why* people got hay fever—he just wanted to know *how*.

To his patients it seemed as if there was no practical use for what he was doing. What could you expect of a doctor who spent his time smearing vaseline on glass plates and leaving them around, collecting them and counting pollen grains. He would not try to treat folks. He did not want to cure himself, because then he could not continue his studies. He admitted he did not expect to cure hay fever. He just told his patients sick with hay fever to go to some place where there was no pollen—if they could find such a place.

There was one famous concentration camp for hay fever "reactionaries" that has gone down in history and literature. By 1860 a few bright people had accidentally discovered places where they were free from hay fever. About 1874 a group of men foregathered in Bethlehem, New Hampshire, and formed the United States Hay Fever Association. The reports, proceedings, and the collected papers of this society read like a cross between Bernarr Macfadden advocating a new breathing exercise and a staff meeting of the *New Yorker* magazine. Witticisms were set off like fireworks. The circle encompassed Dr. Morrill Wyman, Reverend Henry Ward Beecher, Hon. Daniel Webster and Dr. Elias Marsh. Beecher said one of the meetings was the most interesting he ever attended "for no one had said anything that someone else did not contradict."

The humanitarian objectives of the society reached out into all Eternity. They agreed in writing to "carry on work to relieve all sufferers from hay fever, wherever found, during their natural life, and afterward, if permitted."

In 1886 somebody in the club put up $100 as an award for the most outstanding piece of research. A "best essay" contest was held for the pollen pot of gold. Dr. Bishop of Chicago sent in a well-written little item, contending that hay fever was a functional nervous disorder (imagination, to you!). The Association did not subscribe to his theory, but they had to admit he turned in the best-written essay, so he got the research award. This is a clear example of just how far research usually gets when left to groups of jolly laymen.

Hay fever clubs began to form all over the nation. It may be whispered that most of them were closely allied with local chambers of commerce. If you were going to run a health resort what could be better than one for hay fever? Crafty innkeepers, deep in the woods or at the shore, soon found that Mister Average Hay Fever Victim was so glad to be free of his discomfort that he was pleased with everything. But the very ease of the conduct of the business began to defeat commercial resorts. As patients thronged to favored spots, it became necessary to clear more land for kitchen gardens, for tennis courts, for boat houses and canoe clubs, for outhouses and stables. And with clearance of the land up popped the Devil—Ragweed. In a short season or two suspicious sneezes began to vex the guests. Commerce had again overshot its mark.

Of course, as we have intimated, ragweed is not the only source of the nose-tickling pollen. But ragweed is the most

important. We can pin this statement down with a dollar sign, because commercial drug houses make up their autumn "treatment kits" with ragweed.

The pollen trapping idea of Dr. Blackley was a smart one. Today, pollen catchers furnish advance notice of what is in the air. They measure the amount of trouble on the way and identify the agent causing it. There is a battery of pollen spotters, employed by specialists in allergy—some of them in cooperation with the U. S. Weather Bureau. They learn which weeds are coming into pollen-shedding season. They report that weeds have their preference as to soil, rainfall, and climate, and chart the geographical distribution and trends of the various kinds. Today we have detailed hay fever maps for each type of pollinosis. Spotters reach high up into the air. Even in Blackley's time, he used tandem kites to make exposures of his greased plates. The highest exposure was at 1500 feet. Fifty years later airplanes were used to make pollen concentration studies. Today there is an elaborate network of aids to allergists throughout the United States.

". . . TO RELIEVE ALL SUFFERERS FROM HAY FEVER, WHEREVER FOUND, DURING THEIR NATURAL LIFE, AND AFTERWARD, IF PERMITTED."

Ragweed is high in the index of our national pollen count, but so are grasses. Grasses are so much a matter of everyday life that most people do not think of them as a possible source of trouble. Trees are possible sources of trouble. Male and female trees may be miles apart. Nature has made it imperative that enormous amounts of pollen be shed to make sure air borne messages may reach the lady.

But it is never the grass, or the tree, or the flower that makes the trouble. It is that ole debbil pollen riding the wind and reaping a whirlwind of sneezes.

Pollen granules are formed in the male organs of plants. Their function is to fertilize the seed. Not a single fertile seed can form in any one of our flowering plants unless a grain of pollen has carried the spark of life to the undeveloped seed.

It is the drab, uncolored plant, which the allergic person has probably passed by unnoticed, that produces unbelievable amounts of light, dry pollen. The bee snubs it, too. Ragweed has to depend upon the wind to deliver its pollen, and the wind carries it high and scatters it far and wide.

When you consider the hit or miss method of sending pollen grains in the air for fertilizing seeds, the *reason* for the high rate of overproduction is apparent. Even in an ordinary ragweed patch, enough pollen has to be poured out to hit a mark the size of a needle point twenty blocks away. Nature's office of production management runs her air force on a scale that puts humans to shame. There are no bottlenecks.

A single well-developed short ragweed plant has been watched and found to produce *one million million pollen grains*. Under observation, a giant ragweed produced about eight billion pollen grains in five hours.

Pollen grains vary enough in size, shape and general conformation, so that—in a general way—the plants they come from may be identified by inspection of the granules under the microscope of the pollen specialist.

Pollen is a spore and can live for a long time, and under adverse circumstances. A pollen grain is said to be "alive" only so long as it is capable of fertilizing an egg cell. It may live from a few hours to several months. However, alive or dead, botanically, dry hay fever pollens retain their power to produce allergic responses for years. Some have been potent for twenty years.

Some pollens have wings—stationary wings like an air glider. Pine pollen has them and is carried many miles on them. They are microscopic wings and not to be confused with winged seeds. Grass pollens are smooth-walled and spherical and may have indentations on the surface. They look like a golf ball under the microscope, or like a smooth, round ball of clay into which a child has pressed his fingers.

Pollens of the ragweed tribe, Ambrosiaceae in part, include ragweeds, false ragweeds, marsh elder, sunflower, aster, daisy and goldenrod. All have rough and spiny surfaces under the microscope, looking like cockleburs.

Ragweeds shed their pollen best on days when the sun shines. Rainfall washes the pollen out of the air. You have probably noticed that hay fever victims always welcome damp, cloudy days. A heavy wind, of course, stirs more pollen into the air and carries it farther. A wind storm is often followed by an "epidemic" of hay fever.

Weed crops respond to good growing weather just as noticeably as do cultivated crops. The amount of sun and rain during the growing season may determine whether we have an abundant ragweed pollen crop.

Nature, in her distribution plan, adjusts herself to many situations. In the North where the warm season is shorter she hurries to scatter her pollen earlier and continues later in order to pass around enough to reach and satisfy her waiting clients. In the South, (Continued on page 52)

DEFENSE GARDEN POSTER FOR 1942
This has been brought out by the seedsmen and is being distributed by the National Garden Bureau

As in 1917 and 1918, the needs of National Defense are—

Putting the V in the Garden

By ANDREW S. WING

Garden Editor of Nature Magazine

War Gardens; Defense Gardens; Victory Gardens! It does have a familiar ring, doesn't it? History repeats itself within a generation! The last war gave us such slogans as "Can the Kaiser"; now it is "Vitamins for Victory". There are other similarities, but even more important differences between the gardening situations then and now. As the New Year opens, every good gardener and good citizen is thinking of what he can do best to help the cause of national security. It is well therefore to analyze the vital factors in the situation.

Having recently spent several weeks in Washington in close contact with officials in the Department of Agriculture and in defense agencies, we are able to state briefly the broad policies underlying the Defense Garden Program, which is now in process of organization.

Nutrition is the basis of much of the thinking and planning that has gone into the formulation of this program. Our soldiers must be well nourished; that goes without saying. So must our defense workers in fields and factories. England and our other allies must be kept supplied with food. But the present program goes much deeper than that and is of more permanent significance. A war is being waged on the home front against the specters of hunger and malnutrition. Regardless of how long the war lasts, this battle at home will go on until every child and adult in the land is receiving enough of the right kinds of food to eat. This is as it should be in a land of plenty.

In order to achieve this great goal it was necessary to make a national survey of the situation in all its various ramifications. This took time, but it was worth the effort, for the resulting program will work with the least disturbance to existing food-production methods now and after hostilities.

Every farmer who can possibly do so is being urged to have a garden where he can produce fresh vegetables and fruit for home use. This will result in a gain of 1,300,000 farm gardens over last year, if the program works out. Malnutrition exists in rural areas as much as in cities, due to the lack of gardening and the habit of not eating fresh vegetables, fruits and other protective or vitamin-carrying foods.

Community and school gardens will be encouraged where facilities are available and volunteer workers enlist in the cause. These will be primarily to supply food to underprivileged families and to school cafeterias. The plowing up of lawns, parks and golf courses is considered neither necessary nor desirable. Nor is it recommended that city back-yards, and other small tracts unsuited for vegetable gardening, be spaded up for food production as was done in 1917. Ornamentals may well continue to occupy the attention of city dwellers and suburbanites who prefer to grow delphiniums or roses, and would rather buy their vegetables and fruits from the corner food store. Those who do have land suitable for a small home vege-

Will you have a part in Victory?
WRITE TO THE NATIONAL WAR GARDEN COMMISSION — WASHINGTON, D.C. for free books on gardening, canning & drying.

DON'T WRITE TO THE WAR GARDEN COMMISSION

This is a reproduction of an old poster issued in World War I and was widely used to further the garden movement headed by the late Charles Lathrop Pack. Now history appears to be at its proverbial business of repeating

table garden may find it both enjoyable and profitable to devote part of their grounds to the growing of vegetables, small fruits and even a few tree fruits for home use. They are not being urged to do so, but they need not feel that they are being unpatriotic, whichever method they choose as their contribution to Garden Defense. It is recognized in Washington and by garden leaders here and in England that there is great morale value in the growing of flowers and other ornamentals in both public and private gardens.

If the gardeners of America arise to the opportunity as they are expected to do, not only will Democracy be again triumphant throughout the world, but the tiny seeds of victory planted this spring in public and private gardens will sprout and grow into something great—may, indeed, yield a harvest in human health, happiness and beauty such as we have never dreamed of before.

These are no mere idle words. If they sound a bit too ambitious and optimistic, wait until you have heard what has already been done, and what is planned for the future, before forming a snap judgment of what is ahead of us.

Did you know, for instance, that the U. S. Department of Agriculture, through the Surplus Marketing Division, reached 4,600,000 undernourished children during the year 1941? This may appear to be a tremendous achievement, which it is, but bear in mind that there was an estimated total of 9,000,000 undernourished children when the program was launched.

How does gardening tie into that, you ask? Simply this way: there were 67,000 schools that received free surplus food for use in school lunch cafeterias. Since this surplus food, purchased to relieve gluts in the farm market, consisted largely of processed foods or other non-perishables such as flour, sugar, canned milk and pork and beans, it was necessary to supplement it with fresh fruits and vegetables, or canned goods, in order to supply vitamins and other dietary necessities. A majority of these 67,000 schools had school gardens where these essential green stuffs, tomatoes and other vegetables were grown. As most of these products ripened during the summer, it was necessary to can them for winter use in the schools. Community or school canning kitchens were set up and operated by volunteer local labor and under the supervision of trained volunteer experts or home economists. In addition to the schools that had gardens, a number of schools operated canning kitchens where the products were donated by commercial and home gardeners who had a surplus to give away. This sort of war-time work is so basic and has such an appeal to the hearts of all who come in contact with it, that it will no doubt be carried on after the war. A civil war against our greatest domestic enemy—malnutrition—is one that can never end so long as inadequate diet stalks the land.

An epic of America is this story—one that will not be finished for many years. No one should underestimate the importance of this gigantic task. When the war is won and our soldiers and sailors are back at their desks, lathes and tractors, the big job of overcoming hunger and malnutrition both here and in Europe must still be carried on.

Mrs. Roosevelt, Mrs. Henry Morgenthau, and their associates in the Office of Civilian Defense are tremendously interested in this work. So are Secretary Wickard, Director M. L. Wilson, and thousands of other energetic officials and volunteer workers who will see that this good work goes on.

But how can I help? That is the question thousands of American citizens are earnestly asking. The answer is easy. Go to your local defense council and tell them that you want to work in the local garden project. If there is none, find out why not, or inquire what else there is that you

can do. The Department of Agriculture has the technical knowledge and skill but not the men or means to put this big job across, especially in the borderline which lies between farm and city. Volunteer leaders and workers are needed. The other agencies: Office of Civilian Defense, Works Progress Administration, National Youth Administration, Public Health Administration, Office of Education, will dovetail their activities into this gigantic drive against malnutrition.

The revitalizing effects of working in the soil, of growing plants for food and beauty, is another essential part of the present war-garden effort. While this may seem small and a bit selfish compared to the larger garden program, it is not looked down upon in official Washington. In times of emergency it is every citizen's duty to keep himself and his family fit. Release from the worries and nervous tension of long and arduous hours spent at desk or in the machine shop can be obtained by working in a garden, even if it is only in a suburban or city backyard. Those who cannot actively participate in the growing of plants because of lack of facilities may share in the morale-building benefits of flowers and other ornamentals in private and public gardens. There will also be abundant opportunities to enlarge and beautify the plantings around military reservations, public parks and playgrounds, schools, churches, roadsides and other spots that are now either lying fallow or are littered with junk and weeds.

Lessons have been learned, and are being learned, from the experiences of the World War I, and from the way these things are now being handled in England and other countries.

"CAN THE KAISER" WAS A SLOGAN IN 1918

In many an American window this sticker proclaimed that the home owners contributed to the war effort and to feeding the boys overseas by canning the products of their war gardens. This is not yet urged for 1942

A perspective of the present emergency can best be gained by studying what was done twenty-five years ago. It was the honorable duty of the founder of this magazine, Charles Lathrop Pack, to head the War Garden Commission in the spring of 1917. Other prominent men and women who served on the commission were Luther Burbank, Dr. Charles W. Eliot of Harvard University, John Hays Hammond, and James Wilson, former Secretary of Agriculture. The actual executive work—and what a great work it was—was mostly done in Washington.

The scene then was vastly different from that of 1942. Herbert Hoover, head of the Food Administration, had declared that "Food Will Win the War", and no one had reason to believe otherwise. Not only were we faced with the gigantic task of helping the faltering allied forces halt an advancing German army, but our vast food-producing plant was devoted to the growing and delivery of food for the allied armies and for starving millions in Belgium, France, England and the other war-torn nations of Europe. Speed was of the utmost importance and the War Garden Commission devoted its energy to the organization of community gardens everywhere. Idle land and vacant lots in the outskirts of cities, near industrial plants, cantonments and railroads, were broken up in order that vegetables could be grown for home use and for canning and drying for shipment overseas. City backyards and even such sacred spots as Boston Common became the sites of vegetable plots where flourished the humble tomato, string bean, and cabbage.

In 1918 there were 30,000 war gardens in Boston alone. But Marion, Indiana, held the honor of being champion war garden city of the United States. With a population of only 29,000, it had 14,081 vegetable plots, or almost one to every two inhabitants!

Such an intensive speeding up of vegetable production could not have been achieved without a well-organized and highly-concentrated drive backed by all the propaganda methods available at that time. Newspaper and magazine publicity was supplemented by posters and

stickers reminding every citizen of his duty. "The Seeds of Victory Insure the Fruits of Peace" was one of the slogans used in the 1919 post-war effort in war gardening.

That Mr. Pack and his associates did their job well no one can deny. Perhaps in light of what we know now they did it all too well. The war ended with vast unconsumed surpluses of food that farmers had to sell at deflated prices. But had the job *not* been done the war might have ended differently than it did. Furthermore, the garden effort of World War I had many by-products in healthful activity, community co-operation, school gardening, and otherwise.

Figures for vegetable production in leading cities are most impressive: Denver, $2,500,000 in 1918; Minneapolis, $1,750,000; Indianapolis, $1,473,000; Washington, D. C., $1,396,000; and Grand Rapids, Michigan, $900,000, to name but a few of the leaders.

YOUNG AMERICA WIPES ITS BROW

School gardens and other plantings by young people are urged both for defense and for feeding the undernourished among the young

Today the problem is different, but the spirit of America, and the will and the ability to do, are no less vital than in those fateful years of 1917-1918. America's breadbasket will be kept filled, and a surplus will be on hand when the war ends "to write the peace", as Secretary Wickard has well said. Also an even larger battle against malnutrition on the home front has been started—a battle that gardeners everywhere will approve of and in which many will gladly enlist.

Swifts in our Chimney

By HARRY ELMORE HURD

The first we knew that we were not the sole
Possessors of the ancient house was when
The chimney swifts set up a barcarole
Of protest as we knelt upon the hearth
To look up through the flue. "Whose house is this?"
I asked, whereupon they shook the soot
Of years on me, and then, for emphasis,
Confused my question with a whirr of wings,
Not knowing that they were to us a sign
Of fortune. Summer-long we scanned the sky
When quick wings wove an intricate design
Across the dusk. We heard the chittering
Of feeding flyers lunging at their prey
And watched them poise with uttermost lift of wing
Above the chimney ere they sank from sight
Like day abruptly ended. Strange that we
Should hear them flutter in the winter flue
When fire crackles on the hearth, and see
Uplifted wings within the flame of birch!
Somehow, we wish the trespassers might know
That we remember them . . . we miss them so. . .

The trapdoor hunting season opens in southern California when the summer fires lay bare the adobe hills and reveal the hidden trapdoors. Even then they are not easy to find, and youthful assistants are enlisted at a wage of one cent for each door found and marked.

MAKING A MAN OF HIMSELF

By GEORGE ELWOOD JENKS

Photographs by the Author

Imagine, if you can, a vast underground city, extending for hundreds of miles along a billowing surface of adobe hills. The "houses" are tubular, silk-lined pits, with trapdoor roofs—a mysterious Amazonian world, teeming with females of all ages, but where males are seldom seen, and then never in boyhood, almost never in old age, or even in death.

Thus the "underworld" California trapdoor spider, *Bothriocyrtum californicum*, appeared to me during the years I was making a special study of the parasitic enemies of these fascinating spiders. To me, the male has always been the outstanding mystery man of all Spiderdom. Research revealed that the mature males are so rarely found that few of our American museums had specimens—and not one of them had *immature* males. Nor could I find, in scientific records, a single report of the discovery or recognition of a "boy" trapdoor spider.

The trapdoor hunting season opens here late in June or early in July. Summer fires have then burned away the jungle of grass and weeds, revealing well-camouflaged trapdoors. The mother spiders usually spin their purse-like egg-sacs early in July, and, since these eggs hatch, it seems obvious that they have been fertilized. But what has become of the daddies? Out of a total of many hundreds of nests dug up during a season, I have never found a single mature male!

I learned that the trapdoor spider world was an Adamless Eden until about the middle of August, when, almost miraculously it seemed, a new crop of mature males appeared. They were then found in sealed, silk-lined nests that were, as far as I could see, exactly like the "female" nests I had been digging for weeks, and the ratio was about one male to each hundred females. In the tube with the new male I often found fragments of what appeared to be the shed skin of a female. Perhaps he had taken possession of an abandoned "female" nest. But why had I not found any of these "new" males during the preceding weeks? Where had they come from "out of the Nowhere, into the Here"?

The female trapdoor spider usually spins her silken egg-sac in early July. The eggs hatch in about two weeks, but the two or three hundred spiderlings remain in the nest for six months or more.

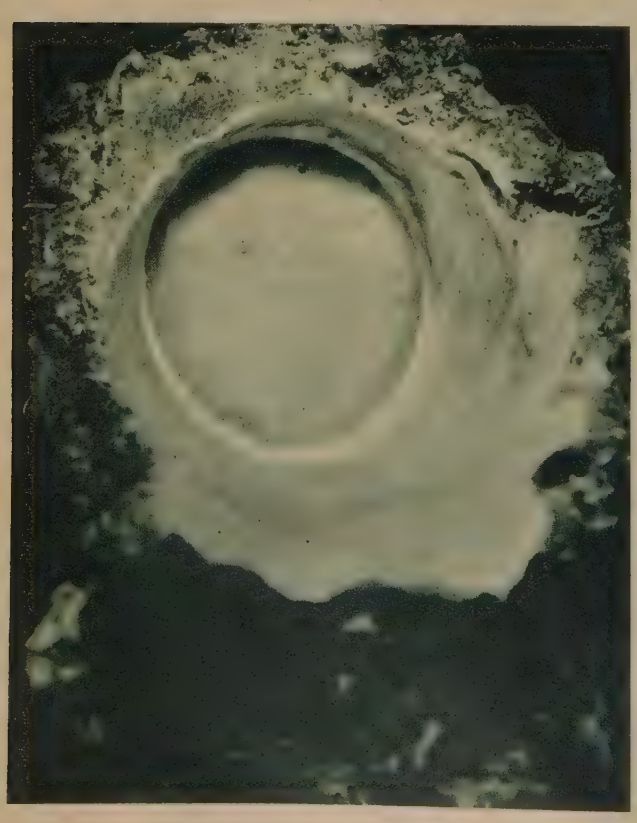
Some students had thought that, like so many other spiders, the "boys" and "girls" might look alike. But somehow I could not accept this theory. It did not seem possible that such a radical change in form and structure could take place in a single molt. Busy with other work, I had to neglect the fascinating problem for some time. And then I fairly stumbled over the solution as happens so often in exploring the world of arthropods. After a day's hunt, I was checking in a bunch of female spiders in the hope of finding some among them that might contain the Cyrtid parasites I was studying. Suddenly I noticed that one of them was getting ready to molt, and I had long been hoping to get some photographs of a molting spider. So I grabbed this prospect, placed it in a photographing cage . . . but the accompanying series of "candid" snapshots tell the dramatic story of that spider's "ma-

turing molt" far better than I can tell it in words.

And so that mystery was solved. But others still remained unsolved, and probably will remain so for years to come. Glimpses of the newly-matured male are sometimes caught after he leaves his snug nest late in the fall to roam the rain-swept hills. But, about the first of the year, the new "jungle" of tangled grass and weeds grows up to hide his love-life, and this whole generation of male trapdoor spiders vanishes into the "somewhere", never to be seen again.

In the following winter, when the rains have softened the soil, the young spiders leave home and build their own nests, each with a tube so small that its diameter is less than that of an ordinary match. In the "spider garden" we numbered each nest and kept a record of the doings of its occupant. Bobby and Danny like to "work in the garden", but Bobby observes that "Mommie spidie wan'na c'ose t'apdoor", as we see her doing in the inset.

Sometimes the males, like the females, seal their trapdoor from below with "rings" of tough silk, sometimes reinforcing this with an added layer of adobe "plaster". Within this nest may be one of the "new crop" of mature males that seemed to appear so mysteriously in sealed nests in August. In the picture at the right we see one of these mystery men of the trapdoor spider world.



Here we see the radical difference in shape and structure between the mature female at the left and the mature male at the right. However, using the width of the carapace, or back shield, as a standard of comparison, these two spiders are equal in size. Below we see the process of molt in a specimen that appeared to be a female but turned out to be a male. The first indication of the molt is the swelling of the flesh of the "back", which raises the carapace. This flips back and "the shoulders shimmy out". It is also apparent that the feet have pulled free from the stiff "boots", because they relax and drop limply. The jelly-like creature continues to emerge slowly, struggling and resting. A final convulsive struggle and the creature flops free. It looks like a miniature octopus. Its legs, however, prove it to be a male. It seems as if a female had turned into a male just by shedding its skin!

The creature slumps down, limp as a dishrag. It may be 48 hours before it recovers its strength and the new skin or shell hardens and darkens. Several hours after the maturing molt it is able to sit up and take notice although it is still weak and wobbly. Vital fluids in its plump abdomen flow into the legs and convert them to solid flesh. At the left is the shed skin and at the right the long-legged spider that came from it. This specimen died and the dotted line indicates the original size of the abdomen, which shrunk. The wedge-shaped tips of the palpi in the immature "shed skin" seem to be the only way of distinguishing the immature males from the females. The tips of the female palpi are straight and tapering. Below, the young but mature male, after several weeks in the nest, sets out in search of romance. After that he is rarely glimpsed, and little or nothing is known of his love-life as he visits his scattered and numerous harems.

TOMCAT

By JACKSON D. EDMANDS

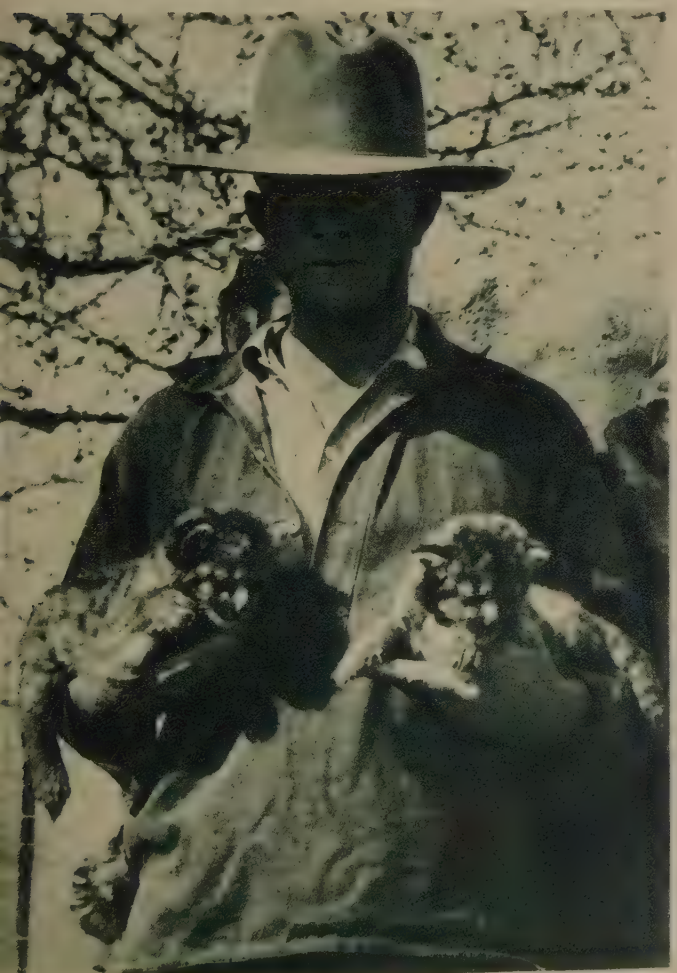
If you were motoring along the highway near Upper Lake, California, and saw a full-grown mountain lion sitting by the roadside giving itself a feline bath, while a man nearby was getting his mail from the mail box, you would step on the gas or run into a ditch. The man would be my father and his companion would be Tom, a seven-year-old mountain lion, a household pet of two-hundred pounds of affection and good breeding.

It started in February, 1934, when two mountain lion kittens were brought home from Mt. Hamilton in a shoe box. The pair—Diane and Tom—quickly took to their adopted home, stealthily stalking each other in the garden. The daily portion of raw meat in a pan at the corner of the house was their kill; the fish pond their mountain water hole. They loved to show their dominance of the garden "wilderness" by suddenly bounding into a group of feeding robins, acting surprised at the sudden scattering of the flock.

Diane was a year old when she succumbed in an epizootic of pneumonia. Tom mourned her for months, calling her and whining softly for her at night.

His loss seemed only to increase his affection for my father. They seem to understand each other perfectly and to have a common language of sounds. On hot summer nights Tom lies outside my father's bedroom window, purring and meowing, to be answered by appropriate sounds from his master.

Although advised to feed the kittens at the start only milk, on the ground that raw meat would arouse their "innate desire to kill", my father saw that the youngsters were undernourished and gave them meat. They took ravenously to it without change in temperament, except for louder whinings at meal time.



At the sound of his master's step Tom comes from his house hoping to be fondled. Tom and Diane were kittens when they first came to the Edmands home.

From the beginning my father adopted a definite psychological pattern in raising the cat. He soon discovered that his methods of handling Tom were no different from those for any other animal pet. Tom has never been teased or treated unkindly. On several occasions curiosity-seekers have jumped or hissed at him, and have been asked to depart. By now, however, Tom is accustomed to the fact that he is a sort of celebrity and is quite indifferent to strangers. It is felt that perhaps the most important single factor in the cat's domesticity has been the straightforward and fearless manner in which

he has been handled. Mountain lions, as a rule, are mean only when they are feared or when man has instilled fear in them. Tom has never recognized fear in those who have handled him and has lacked this basis for treachery. He and the fox and blood hounds on the place pay little or no attention to each other. The cat is unrestricted.

So Tom purrs contentedly today as when a kitten. A true pet, he has shown that kindness and understanding can accomplish much in man's association with wild life.

Tom (right) and Diane posed for their first picture in February, 1934, when one week old. They weighed 1¾ pounds each. At seven months they had begun to lose their spots and had developed well. Now Tom is two hundred pounds of mountain lion and, despite his weight, most enjoys jumping on his master and licking his face in feline affection.

Richardson's owl, dweller of the Far North, whose presence even in winter is rare in regions as far south as Toronto, Ontario. A valuable bird because of its abilities as a mouser, it should be carefully protected.

Richardson's Owl

By HUGH M. HALLIDAY

Into the life of a bird-bander there comes, now and then, a special thrill, as it did to Herbert B. Southam, Toronto ornithologist, who was summoned to a nearby woodland and swamp by a small boy who had "found an owl". In this particular spot near Lake Ontario the snow does not lie very deep; mice and rabbits appear in numbers, and owls arrive for food. This, however, was no ordinary owl, but a Richardson's, rarely recorded this far south, so Mr. Southam's telephone call to me brought me quickly with my camera.

No net was needed to capture it, for all we had to do was to lift it from its branch. In contrast with the saw-whet owl it was very gentle, and when we replaced it in its branch it rewarded us with a far-off liquid note like the voice of a fairy from some bubbling spring in a woodland dell. It was quite unconcerned when we set out to photograph it, so much so that it seemed sick and would not open its eyes for a good portrait. Suddenly, however, a mouse squeaked. The owl's eyes shot open and it flew to another perch, finally settling down to unconcern again.

In its home in the North the owl had learned no fear of man, and in thirteen years there had been only three records of the appearance of this species in the Toronto area. Richardson's owl is a nocturnal bird, known to the

The Richardson's owl proved tame and gentle and quite indifferent to the attention given to it. At the left the saw-whet or Acadian owl, the smallest of the owls in eastern North America. It is shown here, with a mouse, as an indication of comparative size.

Eskimo of Alaska as Tuk-whelinguk—the blind one—because a bird must be blind to allow itself to be picked up so easily. It is closely related to the little saw-whet owl, of more southern range. Besides size, the spotted head and yellowish bill distinguish it. The saw-whet has a rounder head, streaked forehead and black bill, and a more rasping call. Both species are efficient mousers and should be given every protection.

After being photographed and banded the owl was placed in a cage until dark, then offered a captured mouse. This little attention seemed much appreciated. Much excited, the owl grasped the mouse in its bill, and transferred it to its claws. The owl's head swayed back and forth and the mouse sped back to the bill. Then the cage door was opened and, prey in claw once more, the owl launched forth into the night.

Mr. Southam can find no record of earlier banding of the Richardson's owl.

As We See It

THE FUTURE OF THE CCC

"As soon, therefore, as they have completed their present emergency assignment of training workers for the national defense program, the National Youth Administration and the Civilian Conservation Corps should be discontinued as separate youth agencies. Their functions as agencies of vocational training, general education, and guidance should be continued but transferred to state-and-local educational agencies. Their functions as public works agencies should be continued but located with the general agency or agencies of public works."

This is the recommendation of the Educational Policies Commission of the National Education Association and the American Association of School Administrators. It is set forth in a recent report entitled *The Civilian Conservation Corps, The National Youth Administration and the Public Schools.*

At the same time the Roosevelt administration has asked that the Civilian Conservation Corps and the National Youth Administration be combined and continued as a permanent youth-serving federal agency.

The proposal of the educators is predicated on one main consideration. They contend that both the CCC and the NYA have developed into educational agencies with the result that there has been created a significant federal educational activity in competition with—and in some measure in duplication of—the traditional system of state and local education. The Government's proposal stems from the fact that emergency conditions have reduced the number of out-of-employment youth to a point where consolidation is desirable.

We are not in a position to evaluate the contribution of the NYA to youth. We do, however, know something about the CCC.

Briefly, history shows that the Civilian Conservation Corps was established in 1933 to aid out-of-employment young men by providing organized work. Conservation of natural resources was chosen as the work field. Requirements for enrollment were set up, camps were built and the organization rapidly came into being. The War Department was given the administrative responsibility. Various federal agencies concerned with forests, parks, wildlife, soil reclamation and such were assigned camps and men with technical responsibility for the work programs. Projects to keep these men busy were thought up—often, in the early days at least, too hurriedly. Cooperative arrangements were made with State conservation authorities to carry out work programs initiated by them.

Public reaction to the CCC was predominately favorable. Funds for its conduct were generally and generously approved. The picture of young men doing healthful and constructive work in the open captured the public imagination. The combination of social and physical betterment with practical work was appealing. Today the majority opinion seems to be that, of all the money freely handed out by the New Deal, that spent through the CCC probably was least wasted.

As the CCC became established, the value of the projects improved. The cost of the work done, of course, has always been too high for the actual accomplishments. But the public has felt that the social benefits could not be reckoned in terms of dollars, and that without the CCC few, if any, of the projects would have been done for many years, if at all. The actual conservation contributions are matters of disagreement even among conservationists, their views depending upon their respective definitions of the word. Rodent poisoning campaigns have outraged some; over-development of areas through road and trail building have disgusted others; destruction of the forest undergrowth to the detriment of wildlife habitat has aroused others. Yet to the refuge work of the Fish and Wildlife Service; to the fire protection work of the Forest Service; to the improvement of recreational areas under the National Park Service; to the soil erosion control program of the Soil Conservation Service, the CCC has made significant, even if costly, contributions.

All these considerations the Educational Policies Commission sedulously avoids in its report. This is not surprising, perhaps, since educators, by and large, choose to remain consistently blind to the fundamental importance of conservation. In its report the Commission is concerned only with the *educational* activities of the CCC.

It is true that the passage of the years has seen increasing emphasis placed on education of the CCC enrollees. This started with the appointment of educational advisors. Then came the introduction of special skills training. Then came reading, writing and arithmetic for boys who had

missed out on early education. Nevertheless, we do not believe that the educators are correct in classing the CCC as purely educational. They do so in this report, from which one would never gather that the CCC boys had ever cut a fire lane or fought a forest fire; had ever built dams to check erosion or flood a waterfowl breeding area; had ever built trails, picnic areas, camp grounds or bathing beaches. Conservation is ignored, and the Commission concerns itself solely with what is conceived to be a threat to the existing educational system.

The educators propose that the funds now appropriated to maintain the CCC and NYA be allocated to the State educational systems, to provide youth with practical educational training—academic, if need be, and vocational.

We are in hearty agreement with the Educational Policies Commission in opposing further federalization of education and in seeking to check creation of a dual educational program. Nevertheless, assuming that the kind of conservation work done by the CCC should be continued, we do not believe that the public school systems today, or five years from today, could handle it. They do not have the facilities, the knowledge and the appreciation of conservation for such a responsibility.

The Educational Policies Commission has evaluated the educational activities of the CCC and feels that they could be better provided. They are probably right. But they have been definitely one-track in assaying the value of the CCC to the nation. Before it is discarded as a conservation agency, or turned into a youth-serving organization with nothing but a political and educational significance—as it is likely to be through the proposed amalgamation with the NYA—we should like to see a dispassionate and unprejudiced evaluation of the past and potential conservation significance of the CCC. This would have to be made by a competent group that owes no political debts, has no previous allegiance to the CCC, and is not dominated by any federal agency that has benefited from its work. Such a study would be of immense value in the future, when post-war dislocation might bring public works activity again to the fore. We need more than the educators' picture, or the Administration's picture, or the bureaucratic picture, before the CCC is discarded.

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Conservation Comment

Regardless of emergency conditions, the Canadian Resources Bulletin of the Department of Mines and Resources says: "Conservation work must be continued in order to maintain the migratory bird resources of North America. . . ." It is pointed out that trained investigators agree that "observations of migratory game birds in both countries indicate moderate gains and minor losses, affording a basis for restrained optimism." All information indicates an increase in the numbers of the ducks and geese "but that the increase is smaller than desirable." This statement faces facts much better than appears possible south of the border. We could do with more "restrained optimism" and less extravagant advertising of "great increases in ducks" by hunters' magazines, and even by some of the state conservation publications.

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On November 1 the Fish and Wildlife Service issued a release advertising the southward migration, emphasizing that "more than 70,000,000 wild ducks and geese were estimated to have migrated north last spring," and predicting a "successful season for hunters." Seventy million sounds to the general reader like a lot of birds, even in days of astronomical figures, and it seems hardly necessary for the Federal agency charged by law with protecting and increasing our wildlife to promote shooting by glowing publicity.

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It strikes us that the members of the Indiana Roadside Council have an idea in their suggestion that the wood, metals, paint, nails and steel that go into rural billboards could be better used for defense purposes. The members adopted a resolution stating that they are cooperating in conserving newspapers, scrap-iron, rubber, metals, rags and aluminum, and that the billboard industry, with its signboards that are unsightly and a traffic hazard on our highways, might well do its part.

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The American Committee for Defense of British Homes appeals for automatic firearms of all types. Shotguns, preferably twelve-gauge pump guns, are likewise desired. Also there is a great need for high-powered binoculars. Any contributions may be sent to the Committee, 10 Warren Street, New York City.

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Conservationists are finding it difficult to reconcile the vaunted conservation policy of the Roosevelt Administration with the Presidential signature of the bill opening the Organ Pipe National Monument to mining. This action was taken in the face of united opposition from informed individuals and organizations concerned with the protection of these reservations, and from the Federal agencies charged with their administration.

• • •

Wild Birds and Fly-Fishing is the title of the bulletin of the National Audubon Society that discusses the relation between the legislation to check traffic in wild bird plumage and the use of that plumage for the making of fish flies. Some manufacturers and dealers in fish flies have become aroused because certain types of fish flies would be outlawed by the law. We feel that the few minor adjustments that fishermen would have to make should not jeopardize the important drive to stop the sale of wild bird plumage for decorative purposes.

Pennsylvania Tries Cooperation to Solve the Roadside Problem

By ELIZABETH B. and WALTER L. LAWTON

of the National Roadside Council

Cooperation is a device frequently invoked by the billboard industry to avert or delay legal restriction. In view of the publicity given by the industry to the "success" of this device in Pennsylvania, a careful study of the program was made during October and November, 1941. The following article and pictures indicate the results that come from such rearguard action in the roadside war.

THE Pennsylvania Roadside Council, two years ago, started the "Blot of the Month" club. This has since poured thousands of letters upon the desks of national advertisers telling them how deeply the Pennsylvania women—and men, too—resent their rural billboards on the lovely highways of the Keystone State.

Naturally these advertisers were alarmed. Their advertising budgets are not spent to promote resentment. The executive whose desk is flooded with protests turns the letters over to the advertising manager and says: "You've got to do something about this". And the advertising manager "passes the buck" to the billboard agent who sold him the space and says: "This is up to you. What are you going to do about it?" And the billboard agent is on a hot spot. He must quiet the alarm of the advertiser or lose a contract. So he starts a cooperative project.

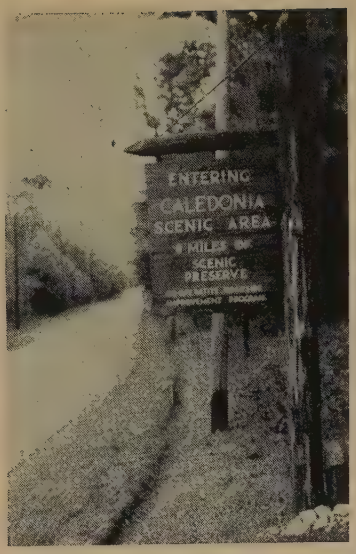
"Cooperate with us and we will solve the problem" is no new slogan of the billboard industry. It has started many cooperative projects within the last twenty years. None have had any noticeable beneficial effect on the landscape. All have paid substantial dividends to the industry.

The Cooperative Project

The state-wide protest campaign in Pennsylvania, plus the fact that a highway zoning bill was in preparation, gave rise to the most pretentious cooperative project yet tried. The Pennsylvania Department of Commerce agreed to sponsor "cooperation" instead of legislation. A Cooperative Roadside Improvement Committee was formed, representing the State Department of Commerce, the State Planning Board and the State Motor Police, the Pennsylvania Hotels Association and the Associated Petroleum Industries of Pennsylvania, the Pennsylvania Roadside Council, and several state and national outdoor advertising companies.

Twenty-two scenic areas were selected with two hundred highway miles, mostly on the Lincoln Highway (U.S. 30) and the William Penn (U.S. 22) between Harrisburg and Pittsburgh. Each area was surveyed by the State Planning Board and the Outdoor Advertising Association, and all signs and commercial occupancies recorded. Artistic markers were designed to designate the areas, and the stage was set for action. But at the date of writing—*fourteen months after the project started*—some 1000 tack, or snipe, signs have been torn off the barns, but on only one area have markers been erected and the intensive removal of signboards started. Yet in other states where they wish to start similar movements billboard representatives are already citing the Pennsylvania project as proof of the success of the cooperative method.

On the eight-mile Caledonia area, where the clean-up started, the billboard industry promptly removed the billboards and signs that it maintained. There was no hesitation on its part. But when the organized boards were down the real challenge—the weak spot in the whole cooperative method—became apparent. The large number



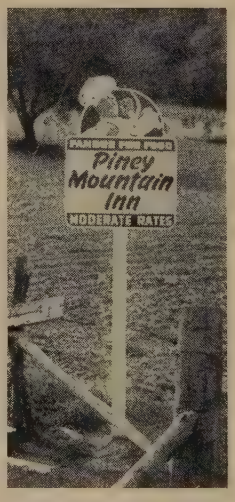
CALEDONIA SCENIC AREA. ALL ORGANIZED BILLBOARDS CAME DOWN BUT MANY LOCAL SIGNS REMAINED

of snipes and "independent" signboards remained, the latter owned mostly by the hotels, garages and such that they advertised.

Who was to remove these "independent" signs? The billboard men claimed they had no power to bring pressure, or even persuasion, to bear on the independent sign owners. Local civic committees must be formed, they said, to handle this admittedly hardest part of the whole job. So the Planning Board is organizing local groups to get these signs down in each area.

It is already apparent on the Caledonia section that cooperation from independent sign owners will be far from one hundred percent. The Lamar Hotel, for example, maintaining three signboards and two barn wall signs, refuses to give them up. The State has already crippled their business, they say, by building the Turnpike that by-passes their towns. For the State now to restrict their advertising is the last straw. Some of the other hotels, restaurants and the like take the same position. It becomes probable that at least ten percent of the existing signs will remain. This experience will be repeated on other areas as the movement progresses.

With even one tenth of the signs remaining, any realist who knows human nature can foretell what is bound to happen. When civic-minded Tom Smith removes his signs only to find that a nearby competitor has kept all of his boards standing, Smith's civic spirit begins to wilt and his signs are sure to return. New enterprises come into the area and bring their signs. The local clean-up committees are not perennials like the billboards, they are annuals. Seldom does one continue in full bloom a second year. Local agitation dies down and the signs flourish. This is the history of all such cooperative projects. The failure of this method has been recently demonstrated on the Waynesboro project in Pennsylvania.



A NEW SIGN JUST ERECTED

Early in 1939 the Waynesboro Garden Club was writing protests to the advertisers. This brought to the chairman's door representatives from the state billboard companies who persuaded the chairman to substitute "cooperation" for the protest method. The local Sunshine Trail, selected for the experiment, was surveyed and the official report disclosed twenty-five signs, of which only one was owned by the organized billboard industry. The rest were owned by individuals and by the local sign operator. The billboard industry promptly removed its one board. The local operator

ONE DOWN; ANOTHER GOES UP

THIS HOTEL REFUSES TO REMOVE ITS TWO BARN SIGNS AND THREE SIGNBOARDS

removed all but one of his signs. But he was a canny fellow and knew human nature. Confident that the agitation would die down he held rights to his locations, paying the rentals and biding his time. Within the past year his signs have reappeared and others have followed. The local committee appears powerless to stem the tide, and we have one more proof that gains made by local agitation cannot be held without a law to back them.

THE WAYNESBORO SIGN MAN PUTS HIS SIGNS BACK AS THE AGITATION DIES DOWN

Gains to the Billboard Industry

In most cases the Outdoor Advertising Association can be depended upon to fulfil its commitments in the co-operative projects, because the industry has very definite gains to make.

In the Pennsylvania State project, while almost no gains have yet been effected on the landscape, the industry has already received two material benefits. The very day the project was organized and publicized the industry gained the weapons with which to quiet the alarm of the advertisers assailed by protests, and to attack the zoning bill. To the advertiser they could now say: "You need no longer fear to renew your contract. All is harmonious. We are working together to solve the problem by cooperation". And to the legislator: "Why pass a drastic untried law? Wait two years and see what we will do by cooperation". These arguments were convincing. They will be convincing again when the next legislature meets, if the project is still under way, for the industry's gains continue as long as the project is alive. Procrastination and delay serve a useful purpose to the industry by prolonging the experiment.

Still another gain has been made because the Pennsylvania project recognizes two of the industry's pet principles: that billboards are acceptable (1) anywhere outside of highly scenic areas, and (2) on town approaches from one to three miles from the town line.

In return for all of these gains, already paying dividends, the Outdoor Advertising Association will eventually remove from the twenty-two areas, if the project is completed, approximately 150 billboards, most of which will probably be relocated on other rural roads.

"COOPERATION" ACCEPTS BILLBOARDS ON SUCH ROADS AS THIS, NOT CLASSED AS SCENIC

"COOPERATION" ACCEPTS BILLBOARDS NEAR TOWNS, TWENTY-ONE ON ONE HIGHLY-SCENIC MILE NEAR LEWISTOWN

The Turnpike

The sincerity of the industry in its desire to protect the beauty of Pennsylvania finds a test on the new Turnpike. A trip across this great highway is a startling revelation of the scenic beauty of the state. The Pike is constructed for a commercial road, seeks easy grades rather than flowing contours and has many deep cuts, yet all this is more than balanced by the scenery that opens before you clean and free from all commercial ugliness.

The Turnpike Commission early declared its intention to keep the Pike free from advertising, proposing to plant out any signs that might appear. The Outdoor Advertising Association countered with a voluntary agreement to erect no signs on the Pike.

THE TURNPIKE NEAR BEDFORD, SURELY A SCENIC SPOT. YET ON U. S. 30 ACROSS THE RIVER NINE BILLBOARDS DEFACE BOTH ROADS. A "SCENIC AREA" SKIPS THEM AND STARTS BEYOND THE BRIDGE

However, two billboards have already appeared close to the road and placed unquestionably to reach the Pike traffic. One board was removed in response to pressure. The other still remains.

There are many similar locations where boards could be placed ostensibly on nearby roads but really to catch the Pike travel. If the Outdoor Advertising Association allows its members to erect boards on these locations it lays itself open to the charge that the voluntary agreement to respect the highway was made for effect only.

Snipe signs are already appearing on barns adjacent to the Pike and protests to the firms thus advertised have been ignored. Camels and Philip Morris cigarets, Prince Albert, Silver Cup and Red Man tobacco, and Clabber Girl baking powder are the most frequent offenders.

The Turnpike Commission, we are told, has turned down an offer of $250,000 from one outdoor advertising company "for the privilege of installing an electric eye system that would flash lights upon billboards along the Turnpike with the passing of every car".

Final Results

If the Pennsylvania project could succeed one hundred percent, what would the State gain? Limited protection on two hundred miles of scenic road, one-half of one percent of the state highway system. This is protection only from advertising signs, not protection against roadside slums, messy gas stations, garages, road houses, junkyards and such. These can be located indiscriminately anywhere within the scenic areas. There is no protection of any sort for the remaining thousands of miles of equally lovely highways within the state.

In contrast with this limited protection highway zoning, such as is proposed by the American Automobile Association, would protect all rural highways, and would segregate all roadside business in suitable areas. Convinced that this is the only real solution for the roadside problem, the Pennsylvania Roadside Council steadfastly continues its work for such legislation.

Apparently other Pennsylvania organizations also begin to question the efficacy of the cooperative method. The Director of the State Planning Board has pointed out that the cooperative program must be considered as experimental until all signs are gone from the first of these areas.

The Secretary of Commerce recently declared himself dissatisfied with the results of the experiment thus far and stated that his department would no longer continue to bear the expense involved; that the clean-up must be effected by those responsible for the disfigurement, and that unless all roadsides in the state were cleaned up within a reasonable time his department would recommend necessary control legislation.

It is the growing opinion of many that the same funds, and the time and energy that have been devoted to the cooperative scheme, if devoted to the passage of a zoning law, would mean far greater gains for the protection of Pennsylvania highways than can possibly result from the present experiment. The billboard industry realizes this.

THE COOPERATIVE PROJECT AFFORDS NO PROTECTION AGAINST THE ROADSIDE SLUM

England's Swans Grow Fewer

By J. D. U. WARD

SWANS IN THE SWANNERY AT ABBOTSBURY, DORSET, ENGLAND
In the background is one of the "pipes" of an old duck decoy by means of which ducks were captured. Abbotsbury normally has about 800 swans

IN ENGLAND many swans' eggs were eaten last summer, the taking of eggs being one of the methods adopted to reduce the numbers of the half-tame mute swans. These very handsome birds, kept or allowed to exist almost entirely for their ornamental value, find much of their own food, but wherever they are numerous they usually receive supplementary rations of grain, which cannot now be spared for them.

The mute swan, *Cygnus olor,* has a royal tradition. The species is said to have been introduced into England from Cyprus by King Richard Coeur-de-Lion on his return from one of the Crusades. In Henry VII's reign the theft of swans' eggs was punishable with a fine and a year's imprisonment. To this day the King of England shares with the ancient Vintners' and Dyers' Companies the ownership of all the many swans on the River Thames. The swannery at Cookham, near Windsor, belongs to the King, and it is thence that George V and Edward VIII sent presents of swans to both Canada and South Africa.

Queen Victoria used to send every member of the Royal Family a present of a cygnet or young swan on New Year's Day, but mute swans are not now regarded as table birds. In the past, however, the mute swan was highly esteemed as food, and accounts of banquets show that numbers of the great birds—full-grown, they weigh between 24 and 40 pounds—were dished.

It was probably because of the swans' value as table birds that the Benedictine monks established at Abbotsbury in Dorset, in the 13th or 14th century, the great swannery that still exists there. The swan population at Abbotsbury varies, but just before the outbreak of war it was about the norm of 800 birds. This ancient swannery is unique although there is a smaller one in Denmark.

Naturally, the conditions that so well suit the swans at Abbotsbury also attract many other birds, from warblers to wild ducks. Abbotsbury is one of the few places in England where the old duck decoy, or trap, is still maintanied.

The mute swan, although beautiful to look upon, has not a lovely nature. It is a bully, distinctly vicious, and prone to murder smaller and weaker waterfowl. Moreover, swans damage freshwater fisheries by eating fish spawn, and they also tear up watercress from cultivated beds. Against this may be set their good work in controlling weeds growing in rivers. Five years ago one English town decided that it would be cheaper to buy supplementary food for swans than to clear the local river of weeds by human labor! And when a factory that had to use surface water in the processing of textiles found that obstinate stains were appearing on their goods, swans came to the rescue. The trouble was being caused by frog spawn, which passed through all filters. A pair of swans obtained for the purpose quickly checked the trouble at its source.

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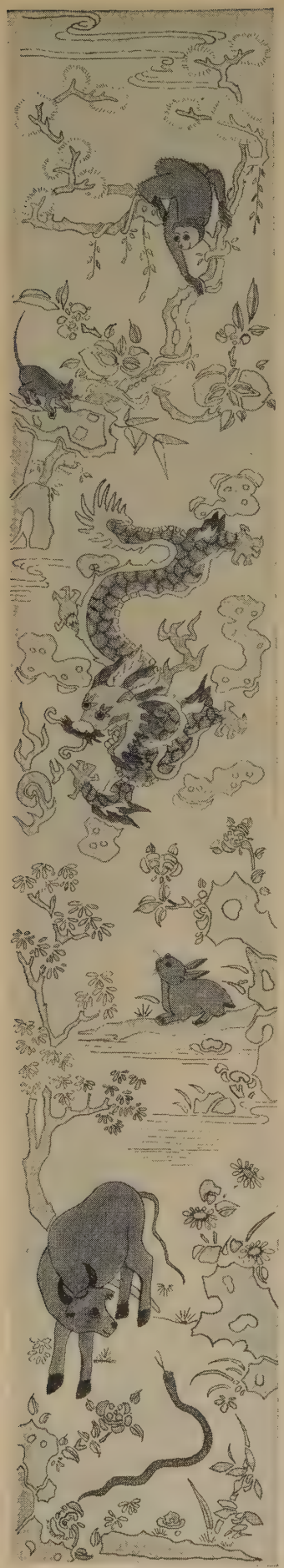
Harmony

By JOHN J. TUNNEY

From South to North in wondrous way,
The stellar gods make Night their Play,
And lesser gods in minor rôle,
Parade the skies from Line to Pole.
The Milky Way's dull silver stream—
A birthplace for the fancy's dream,
With Pleiades gauze of speckled luster
Appearing as a truant cluster,
While grand Orion in curving flight
Proclaims the majesty of Night,
As countless stars of topaz fire
Complete the Playwright's moonlit choir
To chant the nocturnes of celestial grace,
In thundering [illegible]nces of blue-white space.



Superstitions and folk-lore surround—

The Animals of the Chinese "Zodiac"

By MABEL IRENE HUGGINS

Illustrated by Margaret Whitfield

ACCORDING to the Chinese method of reckoning time, cycles of sixty years follow one upon the other, much as we reckon time by centuries. These Cycles of Sixty, as they are called, are divided into periods of twelve years instead of being counted off in decades as in the Western fashion. For each of these twelve years there is a symbolical animal, much as in the Western calendar there are the signs of the zodiac for the twelve periods of the year.

In the cycle of years the animals come in the following order—the rat, the ox, the tiger, the hare, the dragon, the serpent, the horse, the goat, the monkey, the cock, the dog, and, lastly, the boar. Amongst these we may note that there have been included all six of the ones that the Chinese designate as domestic—the horse, the ox, the goat, the pig, the fowl and the dog. Of the others, one—the dragon—is mythical; and one—the serpent—is classed among the five poisonous "reptiles," the others being the scorpion, the centipede, the toad and the spider.

The twelve symbolical animals are important creatures, each having power not only over its year in the cycle, but also over certain specific periods in each day. As regards these daily divisions of time over which the animals exercise their influence, the rat attends to the period from 11 p.m. to 1 a.m.; the ox from 1 to 3; the tiger from 3 to 5, and so on—each in its turn having a tour of duty of two hours. Having lived in a Chinese house, and having had my nights disturbed by rats that were gamboling about over paper and *kao-liang* ceilings, I have always felt that there was a peculiar appropriateness in making the symbolical rat responsible for the two midnight hours. Also, I have often wished that his nimble brethren could have limitations put upon their nocturnal activities by some power, either divine or imperial.

Popular beliefs about the animals of the Chinese "zodiac" are of a good deal of interest. Quite fittingly the rat is looked upon as the symbol of industry and prosperity because of its skill in finding ample supplies of food and its ability in stealing and hoarding it. The people make rather unsuccessful efforts toward the extermination of rats, which always seem prevalent in Chinese cities. In urban markets there are booths for the sale of rat poison—stuffed rats often being on exhibit to attract the attention of prospective customers. By some, the flesh of the rat is believed to be efficacious as a "hair-restorer", so sometimes it is eaten by those with a tendency to falling hair. In regions where the silk industry is important, rats are often an economic menace because they destroy the silkworms.

The ox—allowing the inclusion of both the "yellow ox" and the water buffalo—is of untold service to the "farmers of forty centuries", so there is little wonder that it is the emblem of the spring and agriculture. At the beginning of spring, as long as China remained an empire, it was the custom to have an annual ceremonial ploughing with the emperor himself holding the ox-pulled plough for the turning of three furrows. There seems to exist a rather general belief that large bronze images of oxen have powers over evil water spirits. Such bronze oxen are sometimes placed beside turbulent Chinese rivers to keep vigilant watch lest the river dragons become rough with the dikes and destroy them at critical points. Another strange belief about the ox is in regard to its hearing. Its ears are sup-

posed to be useless, but, legend informs us, it manages to hear with its nose!

The tiger is considered the lord of all land animals and is called the King of Beasts. The Chinese character for *wang,* meaning "king", is usually shown on the tiger's forehead in pictures and embroideries. Soldiers look to the tiger as a model of courage and fierceness. In bygone days they decorated their shields by painting tigers on them. It is believed that the ashes of certain parts of the tiger are beneficial for certain ailments—the whiskers, for example, being good for toothache. Small children are often dressed in cotton clothes that are made of yellow and black tiger-striped material, the cap of the outfit resembling a tiger's head and the toes of their little shoes being embroidered with tigers' faces. The tiger is the emblem of a magistrate's dignity and sternness.

The hare is one of China's numerous symbols of longevity. It is reputed to live to an age of 1000 years, becoming white when it is 500 years old. According to an old legend, the hare, a servant of the genii, lives in the moon where, at the foot of a cassia tree, it pounds out the drugs of immortality. At the time of the Moon Festival in the autumn, small figures of the hare are for sale in Chinese markets.

As the tiger is the lord of all land animals, so the dragon is lord of all aquatic creatures. These two are credited with being the two great forces of the universe. From about 200 B.C. the five-clawed dragon was the symbol of imperial power, and the throne, clothing, and all articles for the emperor's use were decorated with this emblem. There are supposed to be nine main species of dragon and these are used in decorations in various places corresponding to their various characteristics. For example, the one that likes danger is often carved on the eaves of temples, the one that likes music is carved on the screws of fiddles, and the fierce one that is addicted to quarreling is carved on prison gates. In Peking near the north end of the Pei Hai is a beautiful Nine Dragon Spirit Screen. The surface of the screen is covered with marvelously-colored glazed tiles depicting nine actively writhing dragons. This screen is one of the sights seen by the thousands of tourists who have visited Peking since the Imperial Palaces and their grounds were opened to visitors. The dragon is the symbol of vigilance, so this dragon-decorated screen was supposed to safeguard the emperor from evil spirits that might come into the vicinity.

The serpent—commonly known in colloquial speech as the "long worm"—is an emblem of evil and cunning. Throughout China snakes are given good treatment, but that may be because there are few poisonous ones. It may also come from the belief of superstitious folk that fairies, elves, and demons can appear in the form of snakes. They are rarely killed. In fact, they are sometimes cared for and kept by the priests in some Buddhist temples. It is considered a righteous act to buy a snake that has been caught and then set it free. That is one way to lay up merit. On the other hand, bad luck will come to a person if he kills a snake that has made its home under the floor of his house.

The horse is symbolic of speed and perseverance. Sometimes people speak of a bright boy as a "thousand-li colt", meaning that they think he will go far. In times past it has been the custom to use certain parts of the horse as medicine. Insomnia was supposed to be benefited by a drink of water into which had been stirred the ashes of a horse's skull. Using a horse's skull as a pillow was likewise considered beneficial. The wart-like knobs above a horse's knees were called "night eyes", and it was thought that they enabled a horse to see after dark. They were used to relieve toothache. Akin to our horseshoe idea is the belief that a horse's hoof, if hung in the house, will bring good luck. According to a seventeenth century treatise, a good horse should show certain points. Its mane should be soft and made of 10,000 hairs; its ears like willow leaves; its neck like a crowing cock; its tongue like a two-edged sword, and its tail like a comet.

The goat—known to the Chinese as "hill-sheep"—is the emblem of a retired life. For long years it has been used as a sacrificial animal. In North China flocks of goats are commonly to be seen on the mountains, and throughout that region goat-skins are quite generally used as linings for winter coats. Sometimes goats, or sheep, are trained to do simple tricks. Often in the residential sections of Peking boys go through the narrow streets beating gongs to announce that an itinerant entertainer with his little troupe of trained animals—usually a goat, a monkey, and

a dog—is coming and will be glad to put on a performance.

With considerable fitness the monkey is the symbol of ugliness and trickery. It is regarded as the controller of hobgoblins, and it is worshiped by people who are sick and unsuccessful in a hope that it will keep further misfortunes from coming upon them.

The cock is the bird of fame. When associated with the peony in paintings, it indicates a wish for riches and honor. The cock is supposed to be able to change into human form and to be able to bring either good or evil upon people. In order to secure protection from fire, a picture of a red cock is sometimes pasted to the wall of a house. The cock's faithfulness is recognized in the way it keeps count of the hours in its crowing—the dawn-time crowing being supposed to frighten away ghosts.

In China the people value the dog because of its loyalty in guarding their homes. The coming of a strange dog is considered a good sign as it is believed to foretell coming wealth. There is an old Chinese proverb that says, *"Chu lai ch'iung, kou lai fu"* (pig come poor, dog come rich). The God of the Kitchen is supposed to have had one hundred dogs, which were so well behaved and courteous to one another that when they were fed none began to eat until all had arrived and been given food. The Empress Dowager, Tzu Hsi, was an enthusiastic breeder of Pekingese dogs and established rigid rules in regard to their form, color, and other characteristics. For one thing, a person's Pekingese should be suitable in color for his costumes. At one time a very small, black Pekingese was presented by the Empress Dowager to a friend of mine. The wee dog bore the appropriate name "Black Peony" and was well outfitted in a padded basket.

The wild boar, symbol of the wealth of the forest, seems to do all that is possible to destroy any potential wealth of the mountain villagers. In certain districts in which the people are all Buddhists, their religious tenets prevent them from killing boars. Regardless of the fact that the boars sometimes make raids upon the crops and practically ruin the livelihood and food supply of the villagers, their beliefs are so strong that not a finger is raised to harm the plunderers. However, in such localities the people were glad, in the years before the present "incident", when hunting parties of Westerners went in and shot large numbers of boars. The meat of the domestic pig is relished and large quantities are used, especially during the feasting of the Chinese New Year celebrations. Until 1941 the exporting of hog bristles has been of considerable economic importance to China. During 1940 the United States imported a total of 5,639,561 pounds of bristles, 5,317,529 pounds of that amount coming from China.

"Under what animal were you born, Honorable Grandfather?"

"In the year of the horse," he answers. Or it may be the monkey, the rat, the tiger, or whichever. Know it, he does, and without fail. And so do all the other people of China. And they should, for it is the way they tell their ages.

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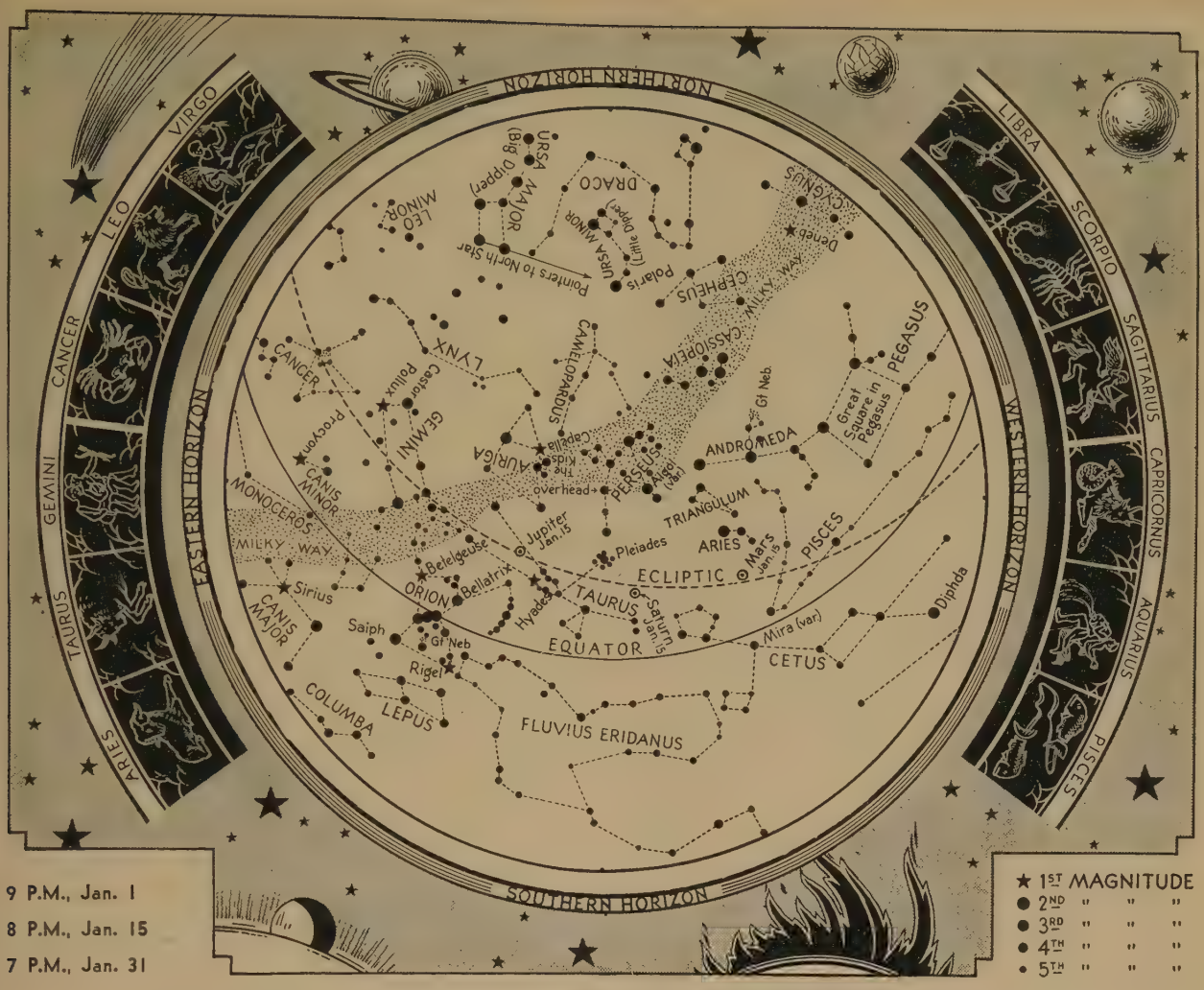
The Witch Hobble Bush

By WARREN C. WILSON

THE witch hobble, also called moosewood, American wayfaring-tree, or just hobble bush, has the descriptive scientific name of *Viburnum alnifolium*. Apparently the names witch hobble and wayfaring-tree were taken from a related European and Asiatic species, *V. lantana*. Superstitious persons believed that it afforded protection against witches and planted it near dwellings, hence the name. Moosewood seems to be an American name, probably given because it is frequent in "moose country," or because they eat its twigs.

This viburnum is a characteristic shrub in damp woodlands from New Brunswick west to Michigan, and south in the mountains to North Carolina and Tennessee. It usually grows in gravelly or shaly acid soil. The straggling, pliable branches of the witch hobble, often taking root and forming interlocking loops, will ensnare objects more substantial than witches. Hikers after once trying to penetrate a thicket of this shrub, which may be six to ten feet in height, learn that "the long way round" is quicker and easier.

The plants produce striking heads (cymes) of pure white or, rarely, pink blossoms. They are made particularly showy by the contrasting shadows around them. The marginal flowers are greatly enlarged and are sterile; only the inner flowers produce seeds. The fruit is a purplish-black "berry" (drupe). The conspicuously veined leaves are large, with rather finely toothed margins. In the fall the foliage becomes a beautiful claret-red—a striking plant.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south.

The Heavens in 1942

By ISABEL M. LEWIS

THE COMING year will have more than the average number of eclipses of sun and moon. There will be five in all, three of the sun and two of the moon. In any one year there can be at the most seven. This has happened twice so far in the present century—in 1917, when there were four of the sun, and three of the moon; in 1935, when there were five of the sun, and two of the moon. This maximum number can occur only when there are eclipses in both the first and last months of the year. There can be as few as two eclipses in a year, but in that case they must both be eclipses of the sun and are generally fine, long, total, or annular eclipses in the equatorial regions. When, as this year, the number of eclipses is large the solar eclipses will be usually partial eclipses only, but those of the moon will be large and total, the moon dipping deeply into the shadow of the earth.

There will be two fine total eclipses of the moon in 1942, both of which will be visible, wholly or in part, in the United States and Canada. On March 2 the moon will rise partially eclipsed along the eastern coast. This eclipse will be visible, partly, over North America, western South America, and the central part of Asia. It will be visible throughout the entire period of the eclipse in eastern South America, Europe, Africa, and western Asia. The total phase of the eclipse will last for 96 minutes. One great difference between a total eclipse of the sun and one of the moon is that a total eclipse of the moon will be seen in its total phase wherever the moon is above the horizon, but a total eclipse of the sun will be seen only within a very narrow path on the earth's surface, that is, never more than about 165 miles wide and about five thousand miles long. Within that path the total phase of the eclipse never is visible more than 7½ minutes, under most favorable conditions. For that reason most people have seen total eclipses of the moon on a number of occasions, but many people have never seen even one total eclipse of the sun.

The second total lunar eclipse of 1942 will occur on August 26, and will be observed under even more favorable circumstances in this country than that of March 2. This eclipse will be visible partly in eastern Africa, eastern Europe, western Asia and the western part of North America, and entirely over the central and eastern part of North America, South America, western Africa and western Europe. This eclipse of the moon will be total for 94 minutes.

The three eclipses of the sun will all be partial eclipses. The first one, which will occur on March 16-17, will be in Antarctica and the South Pacific. It will have a magnitude of .64, that is, this proportion of the sun's diameter will be covered by the moon at greatest eclipse.

On August 12 there will be a very small partial eclipse of the sun with a magnitude of only .06 of the sun's diameter. This also will occur in Antarctica in a very limited region near 70 South Latitude and 100 East Longitude.

The third partial solar eclipse of the year will take place on September 10 and the greatest eclipse will have a magnitude of .52. It will be visible in all of Europe and the northwestern coast of Africa, the British Isles, Greenland, the North Polar regions, Baffin Land, northern Canada, and the eastern part of Alaska.

As far as eclipses are concerned, then, the chief interest of 1942 will be in the two fine, total, lunar eclipses of March and August, which should be well observed in all parts of the United States.

Solar activity may be expected to decrease considerably during 1942 and there should be, on the whole, fewer sunspots and fewer magnetic disturbances with less disruption of telegraphic and radio communications from this source. The sunspot minimum is still about three years away.

There will be no occultations of planets by the moon visible in the United States in 1942, but there will be a number of interesting occultations of the first magnitude star Aldebaran, in Taurus, by the moon during the year. The first of these is on January 27 and will be visible after midnight in the eastern and central states, and in the late evening in the western part of the country. Observations of occultations are valuable because they furnish data for improving the tables from which the positions of the moon are determined. The occultations of bright planets or bright stars by the moon are also very interesting phenomena to observe. The sudden disappearance of the star or planet behind the moon is one of the proofs we have of an absence of atmosphere on the moon.

There will be a number of conjunctions of planets with each other, and with the moon, this year, as there are in every year. The first of these in 1942 will be the conjunction of Mercury and Venus in the evening sky on January 20. Mercury will be at its greatest distance east of the sun on January 25, and it should be possible to see the two planets at the time of their conjunction, although Venus is now drawing rapidly in toward the sun and sets within an hour of sunset. Mercury will be about six degrees south of Venus at the time of conjunction and binoculars might be helpful in observing it. One should be able to follow Mercury in the evening sky on successive nights for more than a week after its conjunction with Venus as its position will be improving during that time. Venus will be in inferior conjunction with the sun at the beginning of February when it will pass to the morning sky. It will be in the morning sky from then on until November 16, when it comes once more into the evening sky. This month is the last when we will see this beautiful planet in the evening sky, then, for some months to come.

Mercury, which darts around in the sky much more rapidly than Venus because of its nearness to the sun, will be in the evening sky this year from January 1 to February 9; from April 20 to June 12; from August 2 to October 10, and from November 30 to December 31. During the remainder of the year it will be in the morning sky. Most of this time, however, it will be too close to the sun to be seen. The dates when it is farthest from the sun in the morning sky—and so best seen before sunrise—are March 8, July 6, and October 26. It will be in the best position for observation in the evening sky on January 25, May 18, and September 15. Venus will be farthest west of the sun on April 13 and will attain its greatest brilliancy in the morning sky on March 9.

In 1942 Mars will be receding from the earth and decreasing steadily in brightness up to the time of its conjunction with the sun on October 5. Then it will be fainter than a star of the second magnitude. At the beginning of the year it is still one of the most conspicuous objects in the sky. On January 1 it is of zero magnitude and outshines Saturn and the brilliant Vega and Capella, but this is only for a day or so, and before the month is over it has dropped half a magnitude in brightness. It will be interesting to observe these rapid changes in the brightness of Mars during the winter and early spring. Mars will pass from Pisces into Aries this month and will be in quadrature, or due south at sunset, on January 29.

Jupiter will start the year in the evening sky in Taurus, a little to the northeast of the Hyades. A deep yellow in color, as compared to the pale yellow of Saturn, it is, next to Venus, the brightest object in the evening sky. Jupiter will continue as an evening star until it passes to the morning sky at the time of conjunction with the sun on June 25. It will not be in opposition to the sun this year. On March 3 Jupiter will be 90 degrees from the sun or "in quadrature," as it is called. It is on that date due south at sunset. On October 18 it will be in quadrature *west* of the sun or due south at sunrise.

Saturn, now also in the evening sky in Taurus southwest of the Pleiades, will be in conjunction with the sun on May 23 and will then pass to the morning sky. It will be in quadrature and on the meridian at sunrise on September 5. The date of its opposition to the sun is December 1, when it will rise at sunset, be on the meridian at midnight, and set at sunrise. Orion, finest of all the constellations, will be visible in the evening sky until early May, when it disappears in the rays of the setting sun, not to reappear in the evening sky until November.

THE TREE OF THE LITTLE HANDS

By BERTHA McKEE DOBIE

FUGITIVE through the pages of old books on Mexico runs mention of *El Arbol de las Manitos*—The Tree of the Little Hands. Writers who name no other plant pause to record this tree with red flowers shaped like hands. Several state that in the whole republic of Mexico only three specimens, or even two, exist. Humboldt, writing in 1811, said that for a long time only a single specimen of great antiquity was known. This was a tree near Toluca. Two cuttings of this ancient tree were made to grow in the fine botanical garden attached to the palace of the viceroys, later the National Palace; and these three, the parent near Toluca and its offspring, were long believed to be the only trees of the kind in the world. The species became as fabulous as the Phoenix, and, like the Phoenix, was resurrected in every traveler's tale.

The statement that an Aztec monarch warred on the ruler of the Miztecs in order to obtain a Tree of the Little Hands may be part of the fable. Certainly the tree was growing in the tropical garden Montezuma had made at the time Dr. Hernández, a Spanish physician, visited the place between 1570 and 1577, for he alludes to it.

Toward the last part of the 18th century a scientific expedition sent to New Spain to study the flora found one specimen of *El Arbol de las Manitos* in the neighborhood of Toluca. According to a Mexican botanist, Prof. Maximino Martínez, the Indians then living in the region venerated the tree and believed that only one existed and that it was the will of the gods that there should exist no other in the world. They had never been able to propagate it. Nevertheless the aforementioned botanists brought some cuttings to Mexico City, and, although with difficulty, succeeded in multiplying the species. From these slips grew the two trees that so excited the curiosity of distinguished visitors during the last century.

The fable of the three trees persisted long after a grove was discovered on a volcanic slope in Guatemala. The Tree of the Little Hands has since been found in the tropical and sub-tropical Mexican states of Oaxaca, Michoacán, Morelos, and Chiapas.

Still it is a rare tree. In 1932 I saw a specimen in the world-famed garden of Mrs. Zelia Nuttall, at Coyoacán, a suburb of Mexico City, where it was prized above all other plants. When it bloomed, the brilliant, varied hummingbirds of Mexico fluttered about the bright red hands stretched out to them by the tree.

One cause for the rarity of the tree is its exacting requirements of soil and climate. Another, no doubt, is the use Indians make of the flowers, which have long been esteemed among them for treatment of diseases of the heart, and which in dried form reach the markets. But even when the flowers are permitted to mature, the seeds apparently germinate poorly. Attempts to propagate The Tree of the Little Hands from seed that Humboldt and his botanist companion Bonpland took to Europe failed. Specimens in Kew and other botanical gardens of Europe have been started from wood. I have never seen The Tree of the Little Hands offered in any catalog.

The name of the tree is the same in various languages. The Aztecs called it *macpalxochitlquahuitl,* which means hand-flower-tree. The generic name of the botanists, *Chiranthodendron platanoides,* comes from corresponding Greek words. The resemblance of the flower to a hand is remarkably striking. The calyx cup is lined with brilliant red, and from it protrude five red stamens, curving inwardly like fingers. These stamens are united for a portion of their length thus forming into the likeness of a palm.

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NATURE'S AUTO HORN

By OSCAR OSTLUND

Spear-billed nuthatch; bird streamlined;
Your traffic signal is explicit—yet refined.

The Lubber

By HUGO H. SCHRODER

WHEN a three-inch grasshopper starts to satisfy his appetite, it takes a lot of foliage to provide a meal. With the enormous lubber grasshoppers (shown here life size) of the southern United States meal time is a sort of continuous performance. They just settle down on juicy green leaves and start eating, pausing only if interrupted. If the plant is one of your prize specimens, you may be astonished to find how much damage one grasshopper can do in the course of a day. When a dozen or more of these slow-moving grasshopper monsters move in on a plant, there may be little left by nightfall.

While these big fellows can do a lot of harm in a short period, they are unable to move very fast; therefore, it is possible to capture the pests without much difficulty. If they were able to fly or jump with more agility, they would be more serious pests to contend with.

Lubber grasshoppers are quite brilliantly marked, but their somewhat handsome coloring is their only good feature. They have a disagreeable odor, which may cause even the omnivorous chicken to pass them by.

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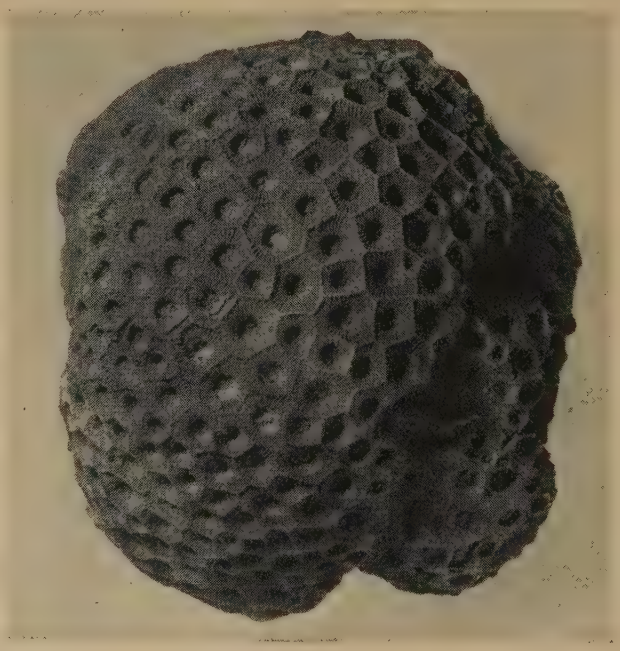
"Petoskey Stones" Are Corals

By CARROLL LANE FENTON



PEOPLE who spend their vacations in northern Michigan often bring home specimens known as Petoskey stones. Some of these have been polished for paper weights, but others are smoothly worn pebbles from the shores of Lake Michigan.

Let us look at a Petoskey stone just as it comes from the ground. We find it near an old quarry, where a layer of shale has been stripped from beds of hard limestone. This shale once was mud on the bottom of a sea, and is literally filled with fossils. We find moss animals, snails, and shells of many kinds. There also are corals shaped like small horns, as well as others that grew in delicate branches that now are broken to bits.

The largest coral of all is a Petoskey stone. It is shaped like a dome, or very thick bun, and is covered with starlike markings that have round pits in the center and four, five or six sides. Ages ago, each of these markings was the home of a coral animal with a soft, greenish body and tentacles that reached out for food. As the coral grew, it built ridges and cross partitions of lime, to which it was securely fastened. Thus it helped to form a biscuit-shaped mass that was almost as hard as stone, even before it petrified.

For several years all went well; then came an accident. A storm swept across the shallow sea, washing mud over the colony of corals. Most of the soft animals smothered, but a few managed to survive. They grew and built new bases of lime; when they reproduced, the young corals spread over the old dead ones. In time the new colony was bigger and thicker than the old one that had been partly killed by the storm. We can see both in our specimen, which finally was buried in mud again and slowly turned into the stone that we find today.

ANCIENT SASSAFRAS

By RUTH SEYMOUR VESELY

TALL, magnificent and proud, an enormous old sassafras tree guards a tiny private burying-ground on the military reservation of Fort Knox, Kentucky. No one knows its exact age, but native Kentuckians declare it is the oldest in the country, and Ripley once featured it in "Believe It Or Not." The circumference of the deeply furrowed trunk is eleven and three-quarters feet. One-hundred and forty-one inches make a lot of waistline!

The tree's gnarled and twisted branches throw dappled shadows over the faded lettering, conventional weeping willows and baby angels cut into the old white gravestones. Children love to gather its three kinds of leaves—"thumbless, one-thumb and two-thumb mittens". A rustic picket fence borders the little plot, where ground-myrtle weaves a shining green blanket, and April daffodils lift happy yellow heads.

The sassafras is a beautiful tree, any season. Not content with producing bark and roots used in medicines, perfumes and even soups, it puts forth clusters of yellow flowers in the spring, and red-stemmed, smooth blue berries in September. When the frost-queen flies over Kentucky, she paints the foliage purple, red and gold.

Beside the fence grow a catalpa, a wild cherry and a black walnut tree—village neighbors of Grandfather Sassafras, and they whisper together in the breeze. Does he tell them about Indians, and the Virginians who came down the nearby Ohio to make new homes in the wilderness? Did Lincoln as a boy ride by with his family when they moved to Indiana, or General Morgan and his raiding cavalrymen gallop past on a wintry night? Daniel Boone himself may have rested beneath this great tree, hungrily chewing its aromatic buds.

Today silver planes soar overhead, and great tanks and trucks roar past—and the tree mutters, shaking its branches. Twelve white people and seven negro slaves sleep beneath it—the family and servants of William Montgomery, who bought the land from the government in 1805 and was buried there in 1831. The sassafras may have been the reason for the plot's location, for the tree stands almost in the center. In 1871 the Sheibel family bought the surrounding farm-land, but promised not to disturb the little cemetery. In 1917, the War Department purchased all the land thereabouts, but to this day the old tree and the graves remain serene and undisturbed.

•

Japanese Fish-Net Floats

By ORLO EVAN WHEELER

Glass floats for which a thrifty Jap
    has spent his hard-earned yen,
And fitly used in seeking food to
    serve the marts of men,
Oft cast adrift, when lashed by waves.
    Loose balls ride out to sea
And aimlessly are tossed about as
    bits of waste debris,
Afloat to spend the endless days
    in milling with the tide
Through thousand, thousand leagues of
    trackless space—disqualified
For fruitful use. Such hapless roving
    waifs, disgorged ashore
By angry waves are caught by eager hands
    and prized the more
For fancied mystery—mayhap responded
    to the swish
Of east-bound liner's chug or trailed
    a school of ocean's fish.
One day Pacific's mood was gruff,
    some were thrown out at dawn
As aliens seeking friendly port
    on the shores of Oregon
And float today in my dooryard pool,
    no more to ride unseen—
Reclaimed to mirror birds who come
    to drink and bathe and preen.

THE SCHOOL PAGE ★★★

EDITED BY DR. E. LAURENCE PALMER

Professor of Rural Education, Cornell University, and Director of Nature Education, The American Nature Association

About Us and the U. S. A.

Many of us think that the present difficulties of the world are going to have to be worked out largely by the other fellow. We are, however, all a part of the present, whether we like it or not, and anyone who shuts his eyes to the fact that we have enrolled a huge United States Army by selecting some of the very best men in every community just is not playing the game.

You may wonder what schools can do about this U. S. Army. You may say that your job is just helping the little folks, but this is not wholly true. Every mother's son and daughter of us has an obligation to help make our national effort a success.

Scattered widely over the continent are cantonments and training camps for our selectee army. The boys from these camps are for the most part in strange territory. Some of them know little of the natural history about them, and many of them want to learn all they can in the short time they have off duty. I know this because of letters I have from some of them. It seems to me that every school naturalist, young or old, should do something to provide simple guides to local natural history sites that may be near training centers. The National Recreation Congress, meeting in Baltimore, recommended that Nature trips be provided and that the local leadership be enlisted to make these go. Don't cuss out the selectee because he raises a rumpus in your town when you are doing nothing to occupy his time more profitably. Twenty-three years ago I was a "gob" at the Great Lakes Naval Training Station near Chicago, and I never go through that town to this day without breathing a word of thanks for the way they provided a variety of wholesome entertainment for us when we were on leave. Now we have a similar situation on our hands.

I should like to suggest that local groups near cantonments provide personally-conducted tours to points of interest for selectees off duty. I should like to see the school help in providing an abundance of Nature trails where selectees could, by themselves, learn what the natural things are about them. If the region has a history of importance to naturalists this history should be made available in either printed or mimeographed form. The schools could help in the preparation of these. I should like to see small, well-kept, local zoos of the wildlife to be found locally, possibly presided over by Scouts if adult leadership is not available. If trips, exhibits, printed material and trails could be changed to go through seasonal cycles, their interest would be sustained.

I should like to see the recreation centers of the training camps supplied with an appropriate Nature library. This could be a project of local naturalist groups. Exhibits of live materials could well be maintained in part by civilian effort.

Communities away from training centers could help the local groups build up rich libraries by collecting suitable sets of bulletins on birds, beasts, bugs and such, sending them to appropriate centers. They could provide road maps and, possibly, transportation for tours to sections the selectees could not reach at their own expense. They could prepare road maps showing where selectees could stop over on their way and get a rich and wholesome education.

If these suggestions win approval from readers of this page, more will be forthcoming. As evidence of what sort of things some selectees are looking for let me quote from what Herbert Jaffe, a selectee, wrote recently about his ideas on good old-fashioned Nature study, the kind of which many of us are not at all ashamed and more of us are inordinately proud. Jaffe says as follows:

"Working at a routine job, day in and day out makes work out of something we thought might be play. Then we turn towards recreation for our leisure time. Millions of dollars are spent on recreation by private individuals and by the government. I want to tell you of a recreation which is open to rich and poor.

"Most of us walk. And what do we see? Nothing but the ground and the buildings. Occasionally, a pretty girl goes by and we take a look at her. But we are blind to most of the beautiful things of life; that is, until someone mentions it to us and then we open our eyes and wonder why we never saw it before.

"Yes, I'm talking about Nature, the trees, the grass, the ivy growing on the wall. Then, we walk into the woods and see a cardinal or to a marsh and see a redwinged blackbird,—that's what I'm referring to. I'm glad someone showed them to me once.

"It's hard to say what you mean by appreciation of Nature, but let me tell you something about why this form of recreation is important. Baseball, football, the movies, yachting, all have one thing in common, expense. In their organized form, these are not open to everyone. But it doesn't cost a cent to take a walk in the woods, in the park or by the pond. There you can see, along quiet paths, chipmunks peeping at you, mallards 'taking off', swans moving gracefully by without a visible source of locomotion.

"I'm stressing the money angle because it is very real to me and everyone asks of a new venture, 'What will it cost?'

"The second thing that Nature gives you is a sense of variety. Everything about you is changing. Nature is not static at all. It is always on the go. It always has something new to offer. We have four seasons, and each has something new to offer. In each season, any place changes so that you could not easily recognize it from the way it looks at another time. 'Variety is the spice of life' they say. Well, here is variety to the *n*th degree.

"An interested and observant person can see something new about him every day. The leaves have just turned from green to yellow. The seeds of maple are now flying through the air. One day, we see a robin on the lawn. Another day, it is a chickadee or a salamander or a dogwood in blossom which holds our attention,—and then here is a nest of eggs we didn't see the last time we were here.

"Yes. Nature is not dead. It is alive. It lives right with you. It grows a year older as you do. That's why it cannot be monotonous but must be fascinating.

"Another thing I like about Nature depends on human nature. Everyone wants to be 'in the know'. Curiosity is a human characteristic and it is in Nature, I believe, that this can be more completely satisfied than in any other recreation. You're on a hike. You see a new flower. You wonder what it is. You find out and you've got something that maybe the other fellow does not have but you like to share it with him. The next time you see that plant, you smile with satisfaction that you know it and the more you do this the more occasion you have to smile. Nature never runs out of new items for you. It may be you never saw the plant in blossom before, or the fish in mating colors. The point is you get something new, and with it some self satisfaction.

"These three definite reasons I can put my finger on but there are more. How many of you have thought, 'Oh, if I could only get away from it all for just a little while. The hurry, the scurry of everyday life, the noise, the tumult, the news of the war, the yell of the children'? Well, just pack up your old kit bag and take a hike in the woods. Just walk. Don't say anything. Just look at the beauties about you and you will say to yourself that this isn't such a bad world after all. When you don't know which way to turn, and you feel down and out, just step out into the woods. There you will find something different from the artificial world that man has built. It will be refreshing.

"This is all an emotional feeling. It's hard to express it in words. You don't know what it means till you try it. Yes, I know you're thinking this fellow is one of those crazy butterfly chasers. Well, I'm not. I'm just an average person lucky enough to have had his eyes open to the beauties of Nature and I'm passing a tip on to you.

"Rich men may have acres of land and gardens galore but you can walk into a woods and in a minute be a king there, maybe more than they will ever be. Yachts may break down. Baseball may become tiresome. The car may crash. The movies may be corny. But Nature is always putting on a three-ring circus for you and it doesn't cost a red cent. It's there waiting for you. Just take a tip from me and go out into the woods. Don't take a portable radio. Leave it at home or stay there with it. Forget your worries and troubles. Just relax and enjoy yourself. I can guarantee that whether you are a novice or an old naturalist you will always find something to hold your interest. You just have to try. That's what I did, and I hope you take my tip."

There are no doubt hundreds and probably thousands of boys who feel just like Herbert Jaffe. They may be in some cantonment somewhere near you. Don't you think you can do something to help them know and like your region just as I, an ex-gob, learned to love Chicago because of the way it treated me when I was in uniform. Writing as an ex-gob, I can say that if the Navy needs this sort of thing I'm sure that the Army needs it more. Anyway, the present emergency puts some real responsibilities on all of "us and the U.S.A."

TO THE EDITOR

It Is Cricket

Dear Sir:

As one belonging to that degenerate type of humanity known as the hunter, I realize that by the definition of Amy Freeman Lee I should feel ashamed of myself and not try to justify my morbid proclivities. In the article "It's Not Cricket" in the October issue of NATURE MAGAZINE, the general thesis seems to be that hunting is, to use her own words, "a process of killing for the sake of and pleasure of killing". Now I will admit that there is a sort of morbid interest on the part of many people in seeing death, as witness the crowds at hangings, and I will admit that as a small boy for a short period of time I enjoyed going down to a certain slaughter house and watching hogs and cattle meet their doom, but I very soon ceased to get a thrill out of this and found other things more interesting. Somehow I just can't associate that early curiosity in death with my later experiences in hunting, although I realize that in the tyro hunter a rather unusual interest in noting how each type of bird or animal dies may be apparent, but this soon wears off as he becomes an old hand at the game, and he notices the aspect of death only so far as it concerns the fact that what game he was pursuing does not escape. In short, my thesis is that the chief lure of hunting is in the love of the chase, coupled with a love of Nature.

My paternal ancestors, for as far back as there is any record, have all been hunters, and I remember as a very young child the pleasure I would get out of going through my father's hunting pockets and pulling out the trophies of the hunt, which gave me a strange thrill I shall never forget. I became interested in wild game not only as objects of Nature but as things to be captured in an exciting game. As a child I managed to capture the young of many wild animals and keep them as pets and I found this even more enjoyable than hunting with a rifle, although it was always the same kind of thrill whether I captured the game dead or alive, but preferably alive if possible. The idea of going out hunting merely for the sake of killing never occurred to me and I believe that is true with the majority of hunters.

As I grew older I found it was rather impractical to try to capture all my game alive and so, to be more conventional, and because I like the taste of wild game properly cooked, I continued to shoot a certain amount of birds and animals each year. And I believe I am physically and mentally better off for it. In this modern age the average man can find more wholesome enjoyment on a hunting excursion than in any other type of activity I know of. A walk in the woods observing Nature is fine. Shooting skeet or firing on the rifle range is enjoyable, but what are these but preliminaries as compared with the real pleasure of going out after some certain kind of game and getting it. By Amy Freeman Lee's definition it may not be sport but that is drawing quite a fine point.

I believe it is the duty of every hunter to shoot only what he and his family can eat, and to be as humane as possible in doing so, taking no chance shots that may result in unnecessary crippling. In other words doing the hunting before and not after the shot, and always keeping the thought of game conservation in mind. But at the same time I believe it is downright close to paganism to be as concerned about birds and animals so as to put them practically on the same level as human beings. I believe man has the right and privilege of enjoying and controlling the lower animals, governed by his own reason and that the thought of killing an animal or bird should cause considerably less apprehension than it does in the case of Amy Freeman Lee.

Parr, Indiana. ROBERT HULMER

Fighting Poison Ivy

Dear Sir:

A recent issue of your magazine devoted some space to the problem of removing poison ivy vines. I have cleared out much of it from our grounds and your readers may find my suggestions helpful.

While I am not very sensitive to the poison, it will cause annoying, itching little eruptions if I do not use care in disposing of the vines. I conceived the idea of using long-handled tongs and bought a pair 24 inches in length, known to the hardware trade as blacksmith tongs. They enable me to pull out the vines and still have plenty of clearance—with care—from contact with hands or clothes.

The tongs are successful if kept clear of wet soil or other adhering substances. This may be done with a stick and thus a tight, close grip can be always secured. It will be found helpful to move along the vine, tearing loose the roots that dig in at intervals, rather than to pull it up immediately on contact with it. Sometimes several yards of vine can be pulled out in one piece.

After two or three seasons of careful removal the vines will be through, except for an occasional shoot or some new growth carried from elsewhere. I make it a practice after working among them to wash my hands thoroughly with Kirkman's Borax Soap, and have not been affected, even in cases where I knew that I had touched the vines slightly.

It is specially desirable to keep the hands off the face, and particularly the eyes. It may be well to add that cold weather is a poor time to remove the vines because they break off more easily then and a thorough job cannot be done.

Metuchen, N. J. H. L. BOGERT

About Lichens

The Lichen Book is being brought out sectionally and on a subscription basis by G. G. Nearing, P. O. Box 338, Ridgewood, New Jersey. Subscription is five dollars, and the author and publisher is following a practice of sending out to all subscribers sixteen-page sections as they are available. When the work is completed the bound volume will be sent to all subscribers. Five of the sections have been completed. The American Nature Association is one of the subscribers to this much needed volume.

Natchez Pilgrimage

World conditions notwithstanding, the Eleventh Annual Natchez Pilgrimage, sponsored by the Natchez, Mississippi, Garden Club, will be held from March 7 to April 7, 1942. It is, indeed, fitting that this should be so in these times when attention to the past serves as an antidote to the present, and to the ideas of certain people for the future.

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NATURE IN PRINT

As a convenience to readers the books reviewed in the pages of Nature Magazine may be ordered through the book department of the American Nature Association, 1214 16th St., Washington, D. C.

(Continued from page 7)

produce the soil upon which life depends."

Fortunately Dr. Kellogg has made it easier for all of us to understand this basic support of our living. He has not only described the materials that make up soils and the composition and arrangement of various soils, interesting information, but he has also made practical applications of his science, and furthermore has discussed the broad social implications of soil science, matters that concern us deeply.

Not a book for such so-called "popular reading" as can be attracted by *Biography of the Earth,* or *About Ourselves, The Soils That Support Us* is still an eloquently simple explanation of a basic science. These three books might well be recommended as a January reading course for those who are interested in beginnings.

Biography of the Earth, while including a wealth of facts from the realms of physics and other sciences, will provide a readily readable account of one concept of the origin of the world that we live in. *The Soils That Support Us* will carry this account into further detail, with a scientific description of a present source of our living. *About Ourselves* will retell in greater detail part of Professor Gamow's account but with closer reference to our own species. Finally, Dr. Needham discusses in the second part of his work "Society in Its Biological Aspects."

About Ourselves is, in fact, an excellent beginning for reading about nature and human nature, either an actual beginning or an annual January re-beginning.

"Our chief joys in life," says Dr. Needham in a passage that indicates the style and character of his book, "are the free gifts of Mother Nature. Our worst troubles are ills of our own creation. Surveying present world conditions, we are shocked to see our most potent knowledge turned to destructive ends. Perhaps it is dangerous for us to know so much about control of the external world forces without knowing more about the impulses that control our own lives: about our own nature and its limitations.

"If we would know ourselves, the living world demands our thought; for of it we are a part. We and the animals are the sentient part of it.... We are partakers with them in life's serene moments, and also in its vicissitudes. In all things fundamental to the welfare of living beings their ways are our ways."

Plant Physiology

Laboratory Plant Physiology. By Bernard S. Meyer and Donald B. Anderson. New York. D. Van Nostrand Company. 1941. 101 pages. $2.00.

This is a second edition of a book first published in 1935, and it follows the general plan of the first edition. This is to describe a series of experiments suitable for demonstration and student performance in the laboratory part of plant physiology courses. The experiments have been carefully selected for their fundamental relation to a study of the subject, although the order provided in the book does not necessarily have to be followed. In fact the experiments are so selected that they will fit into any one of the varied types of plant physiology courses. The volume is so constructed that blank pages are left for comparative notes on the part of the student.

Wood, the Wizard

Dr. Wood, Modern Wizard of the Laboratory. By William Seabrook. New York. 1941. Harcourt, Brace and Company. 335 pages. Illustrated. $3.75.

This is a fascinating biography of one of the most amazing and surprising men in the world of science—one who has contributed to this field most richly in accomplishment and in legend. From his discovery of the Electric Thaw, when a young physics instructor at the University of Wisconsin, down through the imposing record of his work with the physics of light and the structure of matter, during the past forty years at Johns Hopkins, Dr. Wood's life is almost fictional. Even his boyhood and college days are packed with surprises that foreshadowed what was to come. A fearless and original experimental physicist, the subject of this book is a showman whose showmanship is only exceeded by the value and significance of that which he has shown. He has won virtually all the awards and medals and honors that await men in his field, and today, active and robust in his seventies, has, as his biographer points out, become a truly great man who has never really grown up. Mr. Seabrook's biography is superior reading, thanks both to the author's ability and the rich opportunity that his subject offers. While this volume is in no sense a juvenile publication, in addition to recommending it to *any* reader, we would like to suggest it as a perfect gift for any young American of high school age who has imagination and independence of mind.

R. W. W.

American Birds

The Birds of North and Middle America. By Robert Ridgway, continued by Herbert Friedmann. Washington. Smithsonian Institution. 1941. 254 pages. Superintendent of Documents, Washington, D. C. $.40.

This is a descriptive catalog by Dr. Friedmann continuing the work of Mr. Ridgway. It covers the cranes, rails, coots, gallinules, sun-grebes and sun-bitterns. It is, of course, a book for ornithologists and a distinguished addition to ornithological literature.

Piscataqua

Ports of Piscataqua. By William G. Saltonstall. 1941. The Harvard University Press. 244 pages with map of the region and other illustrations. $3.50.

Rich in tradition and maritime history is the harbor of Portsmouth, New Hampshire, and the complicated system of the Piscataqua River. To gather the story of this region and to recreate it in all its significance and fascination, the author spent ten years exploring the area, digging back into all sorts of documents to present a delightful historical volume. He has gathered enough material for a five-foot shelf of historical novels, but has chosen, instead, to distill it into a notable non-fiction volume.

Mountaineering

High Conquest. By James Ramsey Ullman. Philadelphia. J. B. Lippincott Company. 334 pages, with illustrations. $3.75.

This is the story of mountaineering and the history of modern man's acceptance of the challenge of mountain peaks. As such it is a story of adventure, courage and stamina. It deals with the gradual conquest of one height after another, until only a few "unclimbables" remain to thwart the mountaineer. The author is a playwright and producer, but is equally happy as traveler and mountain climber. He has followed the latter urge in the Alps, Mexico and the American and Canadian Rockies, and has so steeped himself in the story of mountain climbing, past and present, that this book is one that *had* to be written. It makes fascinating reading because it is well done and holds that essential of all drama-struggle.

New Field Book

Fieldbook of Snakes of the United States and Canada. By Karl P. Schmidt and D. Dwight Davis. New York. 1941. G. P. Putnam's Sons. 365 pages. Illustrated. $3.50.

This is a splendid and much-needed book. It is a distinguished addition to the Putnam series of field books and one that will be widely welcomed because it fills a serious gap in herpetological literature. The authors are respectively curators of zoology and anatomy at the Field Museum of Natural History. The book has been in preparation for some years. General chapters cover the place of snakes in Nature; snake folklore; history of the study of snakes; definition and classification; external characters and coloration; the poison apparatus and the treatment of snake bite; habits and behavior, and collection, preservation and study of snakes. The remainder of the book is devoted to a systematic account of the snakes of the United States and Canada. The four color plates in the book are supplemented by 103 drawings and 82 photographs from life. For our part we are delighted to receive a copy of this book because it supplies the answer to the frequent request for reference to a worthwhile identification text for field use. Up to now we have been at a loss for a complete answer. Now we have one.

British Birds

World of Birds. By Eric Parker. New York. Longmans-Green and Company. 1941. 295 pages. $3.00.

This is a popular account of bird observations in Britain written by one of England's leading Nature writers. It should be particularly delightful to those who have a nostalgia for the quiet of the British countryside in times of peace. It is good reading for any bird enthusiast.

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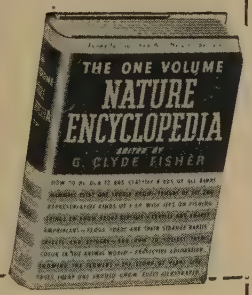

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For A Forest Anthology

If you were going to compile an anthology of poetry and prose of American forest literature what would you include? Arnold B. Larson of the United States Forest Service, 1443 Federal Building, Los Angeles, California, is doing such a task. He would like to have suggestions from anyone as to material that should be included. It would cover forests and woodlands, their trees, trails, streams and wildlife. Only published material will be used.

Mesa Verde Book

An attractive, spiral-bound portfolio of pictures of Mesa Verde National Park comes to hand. It contains sixteen excellent pictures—size nine by twelve—of outstanding spots in the park. On the inside front cover is a location map of the Park and on the inside back cover brief descriptive matter related to the pictures. Copies are available for sixty cents, postpaid, from the Mesa Verde Company, Mesa Verde National Park, Colorado.

Humane Trap Contest

The American Humane Association announces the opening of its fifteenth annual humane trap contest. This year $550 in national prizes will be awarded, plus several special state prizes. The contest is conducted to stimulate interest in the invention, development, production and use of humane devices and methods for taking animals, when it becomes necessary to do so. Past contests have been productive of progress. For entry forms and further information, write the Wildlife Department, The American Humane Association, 135 Washington Avenue, Albany, New York.

Camera Technique

Outdoors with a Camera. By Paul Grabbe. New York. Harper and Brothers. 1941. 104 pages. Illustrated. $2.50.

This is a practical book for the outdoor photographer. It presents in picture and in text the do's and don't's of picture making. Pictorially the book is a collaboration between the author and Joseph E. Sherman. Together they have provided pictures that show—better than any words could do—the good, bad and indifferent, thus graphically giving lessons to the photographic student. It is difficult to see how any photographer could fail to derive benefit from this book.

Controlling Insects

Insect Pests. By William Clunie Harvey and Harry Hill. New York. The Chemical Publishing Company. 1941. 292 pages. Illustrated. $4.25.

Insect pests, hitherto largely considered as a nuisance, have become a menace in many cases as a result of the changed conditions of life of many caused by the emergency situation. Recent years have seen much research in methods of control. This book seeks to assemble information on the best technique in meeting both the nuisance and the menace of insect hordes.

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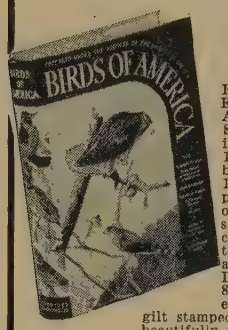

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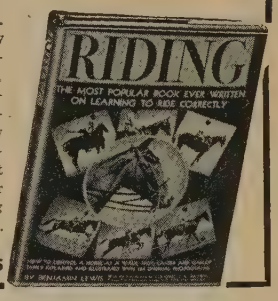

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NATURE—
TWO FLIGHTS UP

(Continued from page 12)

seen eating buds from several varieties of trees each spring, which I presume is their equivalent for sulphur and molasses.

I have put out ears of corn each winter, so that if any of the squirrels are still hungry after eating their ration of nuts they can have dessert of corn. Each squirrel has a different style of eating the corn. Some pull off a single grain at a time; others two kernels at a time; others three or more at once. As a rule a squirrel will eat the germ of the grain, which contains the oil, and drop the balance. When I see one of the older ones eating more than that part of the kernel of corn I know that it expects to be holed up for several days due to coming bad weather.

During the winter of 1939-40, I often saw several pairs of cardinals in the trees. Some of the patients had been successful in luring them to window feeding stations. Last winter I decided to invite them also. The squirrels would eat the cake crumbs, cookies and raisins almost as fast as I put them out, and the lone male cardinal that came around occasionally was not interested in suet, the only thing the squirrels would not touch. He would eat a little cracked corn. It was not until late spring that I accidentally discovered that this cardinal loved shelled roasted peanuts, but they had to be freshly-roasted. Stale ones would send him off in a huff.

A pair of downy woodpeckers discovered the suet and were regular visitors thereafter. The female at first was much less afraid than the male. Three of them, two males and a female, were around last winter, the males being bolder than the female this time. When a pair of red-headed woodpeckers arrived in the spring they set up a blockade zone around the suet basket. After trying for a couple of weeks, without much success, to run the blockade, the downies left the neighborhood for the summer.

There are English sparrows and bluejays around at all times, but the bluejays do not come up for food. They prefer to chase a titmouse or nuthatch as it leaves with a morsel until the smaller bird drops the food in its fright. Then the hi-jacking jay will swoop down and recover the fallen tid-bit.

There are slate-colored juncos every winter, and during the summer there is usually at least one house wren that likes to search the fire escape for any tiny nut crumbs that the other birds, or the squirrels, may have dropped. One of these wrens will turn on the nuthatches when they dare to challenge its right to these. Of course, each spring and fall gives me a chance to see many migrating birds not natives of this locality.

Watching the birds and squirrels from my bed on the third floor gave me a new and absorbing interest that has made three years pass swiftly. So if you know someone who has become discouraged because they are bedridden you might be able to awaken a new interest in life by installing a window feeding station for them. Of course not every locality is fortunate enough to have fox squirrels, but few are barren of bird life, this being especially true once the birds learn where to look for food. For a year I was able to occupy a good bit of my time in reading. But often my eyes rebelled at the strain of so much reading while lying down, and then I was thankful that I had learned to observe Nature two flights up.

POLLEN AND HAY FEVER

(Continued from page 20)

where spring comes earlier, one would *think* the pollen season would be advanced by just that much. But here pollination starts late and lasts but a short time.

Among doctors, allergy has become as much a specialty as is ear, nose and throat work. A large part of the time of the allergist of today is spent in running down the substance that causes that explosive response in his patient. Everything from the pillow you sleep on, the egg in your pancake, to the bears in the zoo, may have to be investigated before your doctor can attempt to protect you from future attacks. The scratch tests he gives you stem from the same idea that Dr. Blackley gave the world through his personal martyrdom.

Pollen research has never been dramatic. It was not in the time of Charles Harrison Blackley and it is not now. But years after Blackley the quiet scientific pot began to boil. Careful experiments began to add up. Their story makes fascinating medical history. Also many nostrums, now discredited, testify to the public demand.

About 1908, Dr. Scheppegrell of New Orleans, engrossed with the idea of fighting pollen with pollen, tried to condition his patients before hay fever season by having them shake bags of dried ragweed in their faces, sniffing at them several times a day. The remedy only produced the disease, earlier and more often.

Scheppegrell had been for a time almost a lone crusader against ragweed on the stalk. He was convinced that the only way to fight the effects of pollen was completely to destroy the weeds. He was able to wring from Boards of Health in various states a great deal in the way of verbal encouragement—but little action.

After a while, Dr. Scheppegrell settled down to maintaining a clearing house for hay fever information. His theme was hay fever botany and identification of pollens. Doctors needed to know where and when their patients were likely to encounter pollen; then, what kind and how much. Scheppegrell wrote a book. Although he was a doctor, less than one tenth of the pages of his book are devoted to the medical aspects of hay fever and asthma. He wrote of what weed pollens did to people—of human allergy. He set down the percentages of folks affected, the pollinating habits of hay fever plants, and where, in the name of geography, weeds were distributed to plague mankind.

More than twenty-five years have passed since pollen extracts began to be given in treatment. So general has their use become that they are manufactured commercially, according to standards set up by the Government. Proper pollen treatment today is safe and usually is effective. The Metropolitan Life Insurance Company conducted a nation-wide campaign, spending vast sums for paid advertising to inform the public of the possibilities of relief from seasonal discomfort. Pollen extracts as they are made today are simply the soluble part of the pollen grains in a suitable preservative solution.

Ragweed can be ousted by cutting the plant. First, just before the flowers form, and, again, before the flowers develop on the low-growing branches that sprout out again after the first cutting. Watch the weed pile if you cut ragweeds. If you do not whack the tops off before flower buds form, pollen will go right ahead and ripen on the severed plant. All cut plants should be burned. Stubble lands should be plowed shallow before the weed forms flowers. If a field is seeded to grass, the autumn growth of ragweed should be cut over with a high-set mowing machine before plants bloom.

Short ragweed may mature and shed pollen at the height of an inch and a half. Do not judge the enemy by the size of the general. Roots are shallow and live only one season, in any case. Spread is through seeds, and they are almost everywhere. As soon as a bit of land is robbed of its forest trees or native grasses, ragweed springs up. Ragweed followed the plow that broke the plains.

Why not get rid of it? It can be cut, pulled, burned and the whole nuisance disposed of within a few short years. Ragweed is one of the most conveniently accessible pests in the world. You do not have to invade a forest, dive under water, or look through a microscope to find it. You just take the walk around the block. It will not hit back at you if you catch it young. The root system is shallow so the whole plant will come up readily to your hand. It exudes no nasty smelling protective juices or oils to stain your clothing; it does not bite or sting or blister.

Can you live with your allergy? If it is caused by ragweed, why should you?

Inside the Zoo

Big Zoo. By William Bridges and Desider Holisher. New York. 1941. The Viking Press. 160 pages. 162 photographs. $2.00.

This is the story of the zoo, its animals and those who care for them. The text, which is by Mr. Bridges, tells the story of the conduct of the zoo, the peculiarities of the animal residents, the problems of satisfying a wide variety of diets and the manner in which other zoo problems are met. This text is beautifully and graphically illustrated by Mr. Holisher's pictures, all of which were taken at the New York Zoological Park, perhaps better known as the "Bronx Zoo". It is a fascinating book, textually and pictorially.

Plants of the Bible

Bible Plants for American Gardens. By Eleanor Anthony King. New York. The Macmillan Company. 203 pages. Illustrated. $2.00.

More than one hundred trees, shrubs, flowers, vines, vegetables, herbs, fruits and nuts are mentioned in the Bible. Most of these may now find a place in an American garden. The author, to facilitate the establishment of such gardens, gives the readers both descriptive and cultural information, as well as, of course, the biblical background. There have been magazine articles from time to time on this subject, but we do not recall any previous attempt to present this subject in a popular book designed to be of practical use to gardeners.

Interested in Shells?

Johnsonia is a publication that will be hailed with delight by all students and collectors of shells, particularly on the eastern coast. It is a new activity of the Department of Mollusks of the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts. The first issue appeared in late October, 1941, and presents in picture and text the genus *Strombus* in the western Atlantic. *Johnsonia,* which is named for Charles W. Johnson in recognition of his great contribution to this field, is being published in response to a demand for such material and on a cost basis. The first issue sells for forty cents and the price of subsequent issues will be based on their respective costs. It is planned to devote each issue to a complete genus, the order of treatment being determined on the basis of interest and the availability of material for study. Anyone interested in shells will want this first number, and, without doubt, its successors. Those interested will be placed on a mailing list and notified of the publication of each issue of *Johnsonia,* and its cost. Write to William J. Clench, Museum of Comparative Zoology, Cambridge, Massachusetts.

Yosemite School

This summer the Yosemite School of Field Natural History will hold its eighteenth annual session. Sponsored by the National Park Service and directed by the naturalist department of Yosemite National Park, the school serves to give training designed specifically for those interested in the interpretive work of the national parks and monuments, as well as allied fields of Nature education. The course of study occupies a period of seven weeks from late June to early August. Due to limited facilities the student body is restricted to twenty. College graduation or the equivalent is required. Applications should be submitted by March 1, 1942. Blanks and full information may be obtained by writing to Frank A. Kittredge, Superintendent, Yosemite National Park, California.

Correspond

Elwyn Lewis, 427 E. Rankin Street, Flint, Michigan, is interested in the collection of butterflies and moths and would like to correspond and exchange with others similarly interested.

Harry L. Johnson, South Meriden, Connecticut, would like to correspond with people interested in the trees and shrubs of the Middle West and the Pacific Coast region. He would like to exchange specimens of wood, twigs, leaves, seed and such.

Charles Ledbetter, 310 North Eighth Street, Ponca City, Oklahoma, would like to correspond with others interested in herpetology.

Cine-Biology

Cine-Biology. By J. V. Durden, Mary Field and F. Percy Smith. New York. Penguin Books, Inc. 1941. 128 pages. Illustrated. $.25.

This is a specialized little photographic book on making biological records with the motion picture camera, including work with microscopic subjects. It presents both practical advice and suggested fields of activity.

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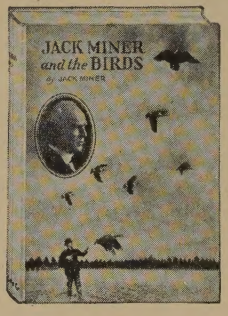

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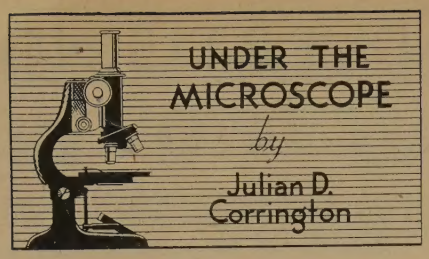

METALLOGRAPHY

II. TECHNIQUE

Illumination was the subheading last month, in preparation for the time when we should have some metal specimens to examine. Now it will behoove us to go on a metal hunt and capture said specimens. That is not as readily done these days as formerly, what with the shortage of this and that. However, the amounts needed are so trifling, none of our readers are likely to require a priority ruling or run into difficulties with the OPM.

Survey the home resources first, then try small and inexpensive purchases at the five-and-ten, finally visiting a tinsmith, repair shop, machine shop, and garage. Aim for variety, securing not only pieces of copper, brass, tin, zinc, nickel, iron and steel (and others), but also different grades and alloys, such as nickel steel, chromium steel, and vanadium steel.

A widely-used size of piece among professional metallographers is ½ x ½ x ⅜ inch, the last-named being the thickness. Rough these out with a hacksaw or snips and place one in a vise, if available, for preliminary smoothing. Use one or more files, decreasing in coarseness as the smoothing continues. The filing, as well as all subsequent grinding by other abrasives, and polishing, is performed differently than with non-metallic subjects, being always in one rectangular direction only, and never rotary or irregular. Moreover, each successive operation is at right angles to the one preceding, until the scratches made by the first are completely removed by the second. Thus, if the first filing is done in a direction which we may, for convenience of description, call north-south, then the second is east-west, the third north-south, and so on. Bevel the edges to a 45° angle.

With the filing completed, most technicians prefer to set the metal firmly in a block of wood, of convenient size for gripping with the hand, about ⅛ inch of the selected metal surface protruding. Various papers are now employed to continue the smoothing procedure. Emery, sand, carborundum and still other abrasive papers are available at low cost in grades of fineness indicated by numbers; 6 or 7 being coarse, 2 or 3 medium, and 0 and 00 fine. Three grades will usually suffice. These papers should be tightly stretched, and one method is to cement them firmly to some perfectly smooth and hard surface, as hardwood, plate glass or steel plate. Decrease the hand pressure as the abrasive becomes finer, and examine the specimen with a hand magnifier to determine when the scratches made in a previous rubbing have been removed.

Next comes polishing—actually a continuation of the grinding, but done lightly and with such fine abrasives as powdered rouge. Begin with coarse rouge, then pass to fine, or secure a graded series of levigated alumina, adjusted to the hardness of the metal being processed. Probably the best medium for holding these fine materials is a small piece of clean, damp chamois, stretched tightly over a block of hardwood and secured by thumb tacks. After each operation, wash the metal and the chamois thoroughly, so that no particles of a coarser material will be carried over into a finer one. Remember each time to alternate the direction of rubbing.

When the finest rouge or alumina has been employed and the metal piece washed and dried, polishing is concluded and the specimen should be perfectly smooth and bright, like a mirror. Remove the metal from the wooden block and handle it thereafter with a forceps, grasping by the sides only. Avoid touching the shining surface with the fingers or any implements.

Most specimens will now require etching, with weak acids or alkalies. These reagents attack some of the metallic crystals more than others, thus bringing their boundaries into relief. Light rays falling on the object from above will then not all be reflected in parallel, as from a mirror or unetched metal surface, but will suffer scattering and hence reveal outlines of components that would be entirely hidden in a merely polished surface. The etching process is like developing a photographic negative; both bring out the structure that is there, but concealed.

Using forceps, dip the metal block into the etching solution for 15 to 20 seconds, then wash at once in distilled water, swirling the specimen about to remove all traces of the etchant. Examine with the microscope to see if sufficiently etched, and if not, repeat until satisfactory.

For iron or steel there are a great many etching formulas, including 10 per cent solutions of nitric, hydrochloric, chromic and picric acids, nital, ammonium persulphate, and others listed in works on this subject; for copper and its alloys, as brass, 50 per cent ammonia in water, or 10 per cent caustic potash. Often heat treatment alone will reveal crystalline structure, while with cast irons, the polished plates are examined unetched, without any treatment. A manual on the subject is needed by those who go beyond the introductory stage.

For examination under the microscope, one convenient method is to affix the block to a glass slide with plasticene. In order to make certain that the block is at a perfect right angle to the optical axis, place it first face down on an absolutely clean and polished piece of plate glass. Surround it with a metal or glass ring that is a trifle higher than the thickness of the object; or use two wooden blocks of appropriate height, one on each side, cut from the same piece of polished hardwood so as to be exactly equal in height. Now place a small lump of plasticene in the center of a slide and invert this over the metal block, pressing down firmly. Lift the slide up, carrying the metal specimen with it. For storage, keep specimens in a glass jar or metal box in which is a small container filled with calcium oxide, to prevent rust.

Filings, wires and other small metal objects may be ground, polished and etched by arranging them within a small mold, using a magnet to aid in orientation if necessary, then filling the mold with molten Wood's metal. When cold, the entire block is processed as previously described.

For those who are sufficiently interested in this form of work as to wish to go into it to a considerable extent, there are commercial grinding and polishing machines on the market. These are electric power-driven and perform the work quickly and easily.

BIOLOGICAL LABORATORY MANUALS

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Laboratory manuals are written solely for use as the name indicates—as guides and references to direct the student in learning facts, performing experiments, and exercising the mind in the laboratory. The intent of author and publisher is that they will be so used by college or high school classes. Those of our readers who are teachers or students in secondary schools or institutions of higher learning will view our subsequent remarks from this angle.

It is not generally recognized, however, that the layman or amateur scientist—the individual working by himself, without the supervision or advice of an instructor—can utilize these inexpensive aids with great profit as directives for courses in self-training. The printed page, generally supplemented by diagrams, drawings and tables, will then serve in place of a personal instructor. All such persons who desire first-hand acquaintance with laboratory specimens and problems in the many fields that form a background for work with the microscope, ought by all means to add a few of these manuals to their library, which is otherwise apt to consist entirely of texts. Since many manuals are written to accompany specific texts by the same authors, it would be advisable to secure the particular laboratory guide designed as a companion piece to whatever text one might happen to own, if such a guide exists. Most of these manuals, though, can be used almost equally well with any standard text on the same subject.

Materials needed to perform the various studies can be purchased at little expense from any supply house, as per our listing in the January, 1938, issue. Many specimens, especially plants, can be collected with ease in most localities, and anyone having the slightest acquaintance with the biological world will know where to capture protozoa, earthworms, insects and frogs. The city pound and abattoir are usually cooperative in providing mammals, tissues, embryos and parasites. Only marine, exotic or rare forms need be purchased as a rule.

The many excellent manuals on the market vary all the way from large cloth-bound volumes to brief pamphlets. Some are printed, others reproduced by the multigraph, planograph, or similar process. Many are provided with spiral wire, cercla, wire-o, or other modern bindings, the pages remaining perfectly flat when the book is opened at any place. Usually there are outline drawings to complete or label, and blank pages for notes.

All of the major subdivisions of biological science are covered, and we shall take them up a group or so at a time. The present installment considers six manuals of general biology. Next month, zoology.

Beaver, W. C., *Laboratory Outlines of General Biology*. Mosby, St. Louis, 1940. Pp. 244; illustrated. Printed. Unbound, sheets in envelope, punched for ring binder. Second edition; accompanies author's text. Excellent and detailed directions along lines of older manuals, by the types method. Does not require support from text. Accordingly is much

better as a purely factual guide than certain of the newer style, principles method, directions. Thus is suitable for both classroom and individual use.

Hunter, G. W., *Manual for College Biology*. American Book Co., New York, 1938. Pp. viii, 280; illustrated. Printed. Rag covers, bound, punched, perforated. Contains much non-laboratory material and is closely integrated with the corresponding text. Exercises are to be filled out and submitted. A very good manual for use as intended, but not suitable for persons outside of organized classes.

McAvoy, Blanche, *A Study Guide for Biology*. Burgess, Minneapolis, 1939. Pp. ii, 235; illustrated. Mimeoprinted. Fiber covers, spiral binding. Organized into nine units, taking up basic studies and experiments with both plants and animals. Not correlated with a specific text. A very good guide at the high school level, well suited for use by beginners.

Mavor, J. W., and L. B. Clark, *A Laboratory Manual in General Biology*. Macmillan, New York, 1936. Pp. v, 201; illustrated. Printed. Rag covers, bound, sheets perforated. Accompanies Mavor's text. Contains much material in considerable detail and adheres more closely to strictly laboratory subjects than do certain of the other guides. However, many questions are asked and sheets are to be removed and handed in, an excellent procedure for class use, but not suited for the individual working alone.

Wellhouse, W. H., and G. O. Hendrickson, *Laboratory Directions in College Biology*. Crofts, New York, 1936. Pp. 104; illustrated. Printed. Rag covers, bound, plates in rear perforated. This manual is intended for the cultural college course, and accompanies a companion text. The instructions are suitable for this purpose but are too brief for the professional student or the layman. Requires the assistance of an instructor.

White, E. G., *A Laboratory Manual of General Biology*. Mosby, St. Louis, 1938. Pp. 262; illustrated. Printed. Unbound, sheets in envelope, punched for ring binder. Second edition; companion to text. A full and practical manual, well written, with detailed instructions for all usual types. Presented by the principles method, emphasizing biological unity. Many experiments, sources of supplies, references, formulas. Suitable both for class and individual use.

TRADE NOTES

A book that fully lives up to its title is Raymond J. Pool's *Basic Course in Botany*. All included material certainly is basic and we can think of nothing of importance omitted. The author has succeeded in writing a most attractive and practical work, suited as an introduction to plant biology for the mature amateur or the future professional, or as an introduction to modern science for the college student who does not plan a major in science.

All the meat that one could want at the introductory level is there, beginning with cells and progressing through plant tissues, organs, functions, classification, ecology, pathology, heredity and evolution. The style of writing is adequate without being brilliant, while the illustrations—almost one to every page—are excellent, with many new photographs and drawings. Among the features we found especially pleasing were the incorporation of illustrations from Hooke's *Micrographia*, Grew's *Anatomy of Plants*, and other pioneer works; certain cartoon diagrams that greatly assist the more complicated explanations; and the emphasis in various sections on plant pathology, often neglected in beginning texts. Pp. v, 654; figs. 541. Ginn and Co., Statler Bldg., Park Square, Boston, Mass., 1940. $4.00.

The Spencer Lens Company, Buffalo, N. Y., has just issued a new wall chart on the microscope and its construction. This is a most attractive item, modern, streamlined, and quite an improvement over previous editions. Cost of production makes it impossible to distribute this chart to individuals, but copies have been sent to A.S.A.M. Chapters, and will be sent without charge to persons who identify themselves as authorized representatives of school or college science departments, or organizations of equivalent status. Write the Company direct and mention NATURE MAGAZINE.

Just issued, in time for holiday gift use, is Roy M. Allen's *Photomicrography*, a badly-needed book. Written by a well known expert in this field, an authority with forty-one years of experience and with thousands of fine negatives in his collections, the new volume is eminently practical and covers every phase of the subject. The various chapters include fundamental principles, professional and homemade equipment, technique, special processes, making of microphotographs, developing and printing, and ends with a selection of fifty superb photomicrographs, each with full discussion and exposure data.

Here is both theory and practice in choice and use of equipment, pictorial composition, proper magnification, illumination, filters, exposure factors and many other points in ordinary photomicrography, followed by optical sectioning, very low and very high powers, vertical illumination, dark field, polarized light, ultra violet and infra red, color and motion photomicrography. Throughout the text, illustrations depict apparatus and contrast faulty with correct technique, and there are many diagrams and graphs. A very well-planned, well-written, and thoroughly useful book, nicely balanced among the sciences served by this art. If you take photomicrographs you will want this volume, whether you are amateur or professional, beginner or expert, biologist or technical specialist. Pp. viii, 365; plts L, figs. 175. D. Van Nostrand Co., Inc., 250 Fourth Ave., New York City, 1941. $5.50.

As many of our readers are aware, the manufacturers of optical equipment are up to their eyebrows these days in defense work and able to pay very little attention to inquiries, orders, or the manufacture of microscopes and accessories. Consequently we are finding it very difficult to secure catalogs or other literature suitable for distribution to our readers. With nearly every issue since the inception of this department in 1937 we have offered to send some interesting and valuable

This department is published as a service to our readers interested in this specialized subject. Its editor is at your service to answer questions on specific problems. He also invites any suggestions as to the inclusion of material that any reader considers valuable. Write to Dr. Corrington.

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Historical Outline

In days of universal distress it is refreshing to sit back of an evening and contemplate world history along broad lines. Whole dynasties rise and fall as one turns the pages of some reference work, and those social cancers called wars flare up intermittently all over the face of the globe. Among their chief accomplishments in the past has been the cluttering up of older history books with a meaningless jumble of names and dates of kings, battles, and generals and how many were killed, wounded and captured on each side.

But if you look for the really significant advances in the story of man you will turn from the political and military to the fields of the arts and sciences, and then you will discover that progress is not gradual but rather by leaps and bounds. Further, if dates of important discoveries and achievements are correlated with political movements, it will be found that the leaps forward occur in those countries and at those times when peace and prosperity are at their greatest upward surge. Then the pendulum swings away again toward wars, depressions and stagnation of the intellect and the headquarters of progress move on to other times, other nations.

So it was with the golden age of the Greeks, with Elizabethan England and with Italy in the sixteenth century. So too with seventeenth-century Holland, then at the zenith of its power. One has only to recall the names of Rembrandt and Hals in art, of Boerhaave in medicine and philosophy, of Huygens in mathematics, physics and astronomy, and of Leeuwenhoek and Swammerdam in microscopy and biology.

Fitting it was, indeed, that Holland, the birthplace of the compound microscope, should have produced two of the three great microscopists of the seventeenth century, the third being the Italian, Malpighi. Of the three, we have treated Leeuwenhoek in two previous installments, and so turn now to his famous contemporary, Jan Jacobz Swammerdam, 1637-1680, of Amsterdam.

It would be difficult to pick out two men of more opposite personalities than Leeuwenhoek and Swammerdam. Leeuwenhoek—the discursive amateur, strong, composed and long-lived, delving into every field toward which he could direct his lenses, discovering more new single items than anyone else, yet leaving behind him no completed monograph nor carrying out any line of enquiry to a logical conclusion; Swammerdam—the ardent, restless, and stubborn devotee, bucking sensible advice and with feverish energy burning himself out at the age of thirty-six, but meanwhile performing minute dissections and carefully-worked-out studies of surpassing excellence, never before approached.

Swammerdam's father was an eccentric and wealthy apothecary who accumulated the finest private museum in Amsterdam, with specimens from all corners of the globe as a consequence of the huge commerce then enjoyed by the Dutch. The boy Jan, thus surrounded by natural history specimens, grew up in a favorable atmosphere and developed a great love for the subject. He studied medicine at the University of Leyden, where he was associated with Sylvius, de Graaf and Steno, then traveled and only later received his M.D. degree.

Some of his contributions to anatomy and physiology are worthy of mention, including observation of the red blood corpuscles of the frog, discovery of the valves of lymphatic vessels, experiments on the irritability of nerves and the contraction of muscles, and invention of the method of injecting blood vessels to assist in their dissection.

His chief claims to fame, however, rest on his remarkable expositions of insect anatomy and discovery of their metamorphosis. With the finest microscopes available, he would work for endless hours in a painstaking exploration of minute structures then, after brief snatches of sleep, would throw himself at the delicate task of drawing these dissections with the utmost fidelity. In spite of opposition from his father and the drain upon a constitution weakened by malaria, he kept passionately at this sort of work until, his health broken, he fell under the influence of Antoinette Bourignon, founder of a religious sect, and traveled about Europe in her retinue until his death.

Certain of his earlier works were sent to the Royal Society and appeared in the *Philosophical Transactions,* but the bulk of his considerable material remained unpublished until brought out fifty-seven years after his death by the wealthy Boerhaave, under the title *Biblia Naturæ* or Bible of Nature (1737-38). Of the dozen or so species of insects treated, his treatise on the bee is the most complete and masterful although he acquired greater fame from his monograph on the mayfly, with its exquisite drawings of internal anatomy, the like of which had never before been seen.

In the *Biblia Naturæ*, Boerhaave included a life of the great microscopist, giving us interesting descriptions of his personality and methods. The only known portrait is attributed to Rembrandt. Other contemporaries have told of his fondness for catching someone, such as Leeuwenhoek or Malpighi, in error and then correcting him. It must have kept all other workers on their toes to realize that any sloppy piece of research would likely call into play the sharp tongue of Swammerdam.

His methods were unique. He made his own dissecting instruments and they were so extremely small and fine that the scissors and knives had to be sharpened under a microscope. With them he could dissect the internal organs of a bee with the same dexterity as employed by the average practitioner in human surgery. He was an expert at drawing out glass tubing to capillary fineness in order to inject vessels or inflate hollow organs in a small insect.

To Swammerdam we owe discovery of the nature and functions of the castes of the hive—queen, drone and worker; of the structure of the four stages in the life history—egg, larva, pupa and adult; and of anatomical details of the simple eye, compound eye, proboscis, sting, and internal organs, along with many other facts about bees. His work established a vogue for exactness and precision that was soon to spread to all fields of science.

WORKING WITH THE MICROSCOPE

Dr. Corrington's new book with the above title (Whittlesey House, New York, $3.50) on how to prepare objects for microscopic study will be welcomed by all beginners, for it tells just how to do things and is by one who knows by actual experience. As a teacher, the author, Dr. Julian D. Corrington, realizes the needs of students in all stages of advancement and has the knack of telling them just what to do and how to do it in a given case. The writer of this review, after seventy years' experience with the study of objects by means of optical instruments, welcomes this book for the younger generation and sees how it meets the need for information on how to accomplish certain results. In a word, it is a book that would have been most acceptable to him in his early years when guides were few and mostly vague.

While this book is meant largely for young workers, even the oldest will find in it no end of hints and information put in clear and compact form. It covers a very wide field, commencing with the simplest operations for temporary study and proceeding gradually to the very complicated operations with which the advanced worker must deal. Its excellent index makes the varied contents easily available, and the tables of refraction and weights and measures, and the lists of other books and sources of supplies make it handy for workers at all stages of development. It covers the whole field, animal and plant, and the multitude of subjects in the inorganic world.

The book is especially designed for those who do not have personal instruction in laboratories where experts are available to help over the hard places.

Dr. Corrington knows how it is possible to make for oneself almost everything; how to use apparatus and material ordinarily thrown away; what will take the place of expensive material, and at the same time what an advantage in future original work will be the experience and skill acquired in adapting unusual apparatus and material to meet one's needs.

One good feature of the book is the selection of the material to work with. In bacteriology the beginner is advised to deal with harmless organisms and to leave the deadly ones for more experienced hands. There is often a happy way of putting the advice to make it tell. For example, in the above instance the beginner is advised "not to flirt with the undertaker" by selecting such forms as the anthrax bacillus to work with.

Particularly to be commended is the insistence on learning to do things in the simplest way, as in section cutting. There the temptation is to think that nothing can be done without an expensive microtome, when, the truth is, most of the great fundamental facts in animal and plant biology were found out by the use of sections made free-hand, and by dissection with needles. Then, in the perfecting of these free-hand methods, one gains a skill that is of inestimable value even when one is aided by all the precision machines available. For, curiously enough, those who have gone farthest find that even an automatic machine works best when directed by one who is skilled in handling simple instruments.

While we congratulate the author on the completeness of his work and the publishers on the neatness and excellence of the printed book, we congratulate most of all the many people who will find in this book a guide which will start them on the right road in microscopy and help them to become masters in this important and fascinating branch of knowledge and service to mankind.

SIMON HENRY GAGE.